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JPRS 84360

20 September 1983

USSR Report

ECONOMIC AFFAIRS

No. 1061

EKO: ECONOMICS AND ORGANIZATION

OF INDUSTRIAL PRODUCTION

No. 5, May 1983

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USSR REPORT ECONOMIC AFFAIRS

No. 1061

EKO: ECONOMICS AND ORGANIZATION OF INDUSTRIAL PRODUCTION

No. 5, May 1983

Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.

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PRESENT-DAY VALIDITY OF MARXIST DIALECTIC EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian
No 5, May 83 (signed to press 11 April 1983) pp 3-22

[Article by V. A. Mindolin, candidate of historical sciences, Novosibirsk State University: "A Live and Effective Historical Force"]

Marxism--a weapon, a combative method.
Use this method skillfully!

V. Mayakovskiy

[Text] The revolutionary dialectic is the nucleus of the Marxist tradition. Marx was always true to the principle that history resolves the most essential, vitally important issues of life in a revolutionary way. The main lessons of life for Marx were lessons of revolutions. He placed an unusually high value on the role of revolutionary periods in the life of mankind. The revolutionary dialectic comprises the soul of "Das Kapital," in the words of Engels, this complete and final scientific revolution.

The idea expressed by Marx and Engels even in "German ideology" is imperishable: "Both for the mass result . . . communist awareness, and for the achievement of the goal itself, it is necessary to have a mass change in people, which is possible only in a practical movement, in revolution; consequently revolution is necessary not only because there is no other way of overthrowing the ruling class, but also because it is only in revolution that the overthrowing class is capable of casting from itself all that is old and loathsome and becoming capable of creating a new basis for society."¹

Our age is perceived as a period in world history that is unified, whole and filled with revolutionary changes. Interpretation of it makes it possible to see in clear and pure form the dialectic of the class struggle, tracing the straight line of the historical effect. Marx never lost sight of this historical straight line. The zigzags of history and the inevitable compromises in the development of society only strengthened his desire to find the shortest path to the goal. He perceived struggle as the basis of life.

Communists have always been distinguished by their decisiveness of selection. Describing the relationship between reform and revolution, Lenin wrote about the fact that before the victory of the proletariat reforms were a byproduct of the revolutionary class struggle of the proletariat. "After the victory of the

proletariat, if only in one country, there is something new in the relationship between reform and revolution. In principle the matter remains the same, but in form there is a change . . . before the victory of the proletariat, reforms are a byproduct of the revolutionary class struggle. After the victory they (being the same "byproducts" on an international scale) are for the country in which the victory has been achieved also a necessary and legitimate respite in those cases when, after the greatest exertion, these forces are not adequate to revolutionary fulfillment of one change or another."²

Consequently one speaks about a change in form. The revolutionary approach to solving existing and future problems even today remains the basis of the proletarian class and national initiative.

And these problems, as Marx foresaw, have become extremely complicated. Anyone who cannot deal with the ramified interweaving of increasingly intensive and multifaceted interconnections and interdependencies today is placed in the position of Gulliver, apparently aware of their power but lacking mobility, securely bound by the hands and legs "by the force of circumstances." This is why it is so necessary for modern man to have that ability inherent in Marx and so highly valued by Lenin to think in a revolutionary and dialectical way. Even more definitely: without a study of Marxist dialectics it is impossible to gain an understanding of modern reality.

The pre-Marx style of thinking was typically subordinate to the spontaneous elements of life. Overcoming the immense resistance of material, Marx brought thinking onto an independent path. The interconnection between theory and method is remarkable in Marxism. The dialectic is not only a method; it is a radical theoretical foundation for Marxism.

The year 1858. Marx was working then on "Economic Manuscripts." "For the method of processing material," he wrote to Engels, "I was helped a great deal by again leafing through Hegel's 'Logic'."³ Hegel had a great influence on Marx. The rhythms of Hegelian dialectics in one way or another reflected the pulse of the real world toward which Marx strove. But Hegel was bound to the path; Marx went forward—toward the future. Having liberated Hegel's method from mystification, Marx became, in V. I. Lenin's words, the first of the materialist friends of the Hegelian dialectic. Marx's revolutionary method was conditioned by the objectively revolutionary nature of the situation, the revolutionary nature of the theory that was directed toward a decisive change in society.

When we turn today to the lessons of Marxist dialectics we cannot but see that the idea not only of revolution, but also of social evolution has become the property of mankind because of Marx. Marxism led to an awareness of the internal impulses for development that are produced by contradictions and showed the interdependence and inseparable links among all aspects of each phenomenon. World development is now perceived as a unified and profoundly predictable process. This is the greatest victory of reason.

Marx was wonderfully oriented in the complete contradictions of historical development. He became a pilot in the colossal historical current, bearing mankind forward. By interpreting and consciously singling out internal ties

and contradictions in society, and achieving public awareness of contradictions and antagonisms, Marx took a vitally hostile and sarcastically smiling attitude toward attempts to "extinguish" contradictions and reconcile opposing elements.

There is another, no less important, aspect of the issue. "Contradiction," asserted Hegel, "appears only where there is a relationship."⁴ Formulating and developing the investigative approach to reality, Marxism stimulates in mass awareness an interest in analysis of connections. The "connection" and the "contradiction" are two fundamental categories of Marxist dialectics. An in-depth study by Marx of the dialectics of bourgeois society showed how quickly the number of economic ties increases, how the strain on them grows, and how necessary it is to develop antagonistic forms of their manifestation. In "Das Kapital" Marx also gives a projection into the future and sketches the contours of the dialectics of the communist society. He saw public production of the future as "a unified, broad and harmonious system of free cooperative labor,"⁵ the sovereignty of universal and complicated interconnections.

Under the conditions of developed socialism the connection and interdependency among the most varied elements of the national economy become richer. The internal connection of things and events becomes closer, although not necessarily obvious. This circumstance is decisive for transforming socialism into a deep total, dynamic system. Social, political and other factors of development today are being subordinated increasingly strictly and directly to production relations and, on the other hand, they themselves actively influence them. The repeated ramification and comprehensive universalization of national economic interconnections lead to an aggravation of old and the appearance of new contradictions, exacerbate the consequences of any contradiction that is not promptly resolved, and increase the social significance of promptly making effective decisions.

The socialist economy is highly dialectic and it teaches dialectics. These are sometimes difficult lessons. But they are always useful.

Reality is filled with decisive revolutionary changes. That which seemed true yesterday may retain only a relative value today. It is therefore extremely important to search for better and better forms, a permanent connection with live reality. Modernity is especially intolerant of the fact that "the outdated strive to be restored and consolidated within the framework of newly arising forms."⁶ Positive economic activity requires a high level of social, and particularly of economic, thinking.

Marx and Lenin had no doubts that the arrangement of the extremely complicated and precise network of economic relations in a socialist society "can be successfully carried out only with independent historical creativity of the majority of the population, primarily the majority of the workers."⁷ The new structures of the economy are created deliberately by the activity of the millions.

Marxism takes a harshly critical attitude toward elements of conservatism and inertia in economic thinking. Revolutionary dynamism is inherent in socialism as a system. But the force of inertia and old habits, as was noted at the

November (1982) Plenum of the CPSU Central Committee, appreciably impede progress today and impede the work for improving the economic mechanism.

Much of this has to do with the fact that thinking is not dialectical enough. It has to do with the inability to completely understand economic relations in their concrete development, to perceive and interpret economic ties. Sometimes the approach is too direct when the course of development is of necessity a spiral. There is indecisiveness before a dialectical leap. There is not a profound understanding of the dialectic of the transition from quantity to quality and vice versa. As a result there are shortcomings in control in a specific economic situation.

Marx laughed at the boorish nature of "healthy human thought" which is dug from the "dregs of life" and does not adulterate its own natural inclinations with any philosophical or other scientific occupations: "In places where it succeeds in noting difference, it does not see unity, and in places where it sees unity, it does not notice differences. When it establishes distinguishing definitions they are immediately ossified, and it regards the most harmful sophistry in a desire to light a flame from these ossified concepts by striking them against one another."⁸

The so-called common sense, which catches only the superficial appearance of things, is inclined toward eclectics and far from an understanding of dialectical movement. It tries to mechanically preserve the "good" aspect of the contradiction by eliminating the "bad," without suspecting that the solution lies more deeply and frequently in a completely different place. Hence the simplistic idea which was criticized by Engels of cause and effect as two poles that are unchangingly juxtaposed to one another; but they do not see their interaction.

Is it not obvious that without a profound grasp of the interconnections among economic, social and ideological-moral factors it is impossible to foresee the consequences of any large economic decision? Is it not clear that among the reasons for the spreading of departmental and local tendencies is the failure to understand the dialectic of the general, the particular and the individual, which leads to a narrow, one-sided perception of specific economic situations, irrespective of life and the development of the national economic whole? And therefore the profoundly dialectical assertion of the November (1982) Plenum of the CPSU Central Committee concerning the need to strengthen responsibility for the observance of statewide and nationwide interests, to decisively extirpate departmental and local priorities, and to overcome the force of inertia and old habits.

Is it really necessary to prove that a lack of dialecticism is, if you will, also bureaucratic thinking? Consistent democratic centralism presupposes mass mastery by economic personnel of the method of Marxist dialectics. And bureaucratic centralism, just like anarchical decentralization, is alien to dialectics. And a subjectivistic approach, by causing the executive to fall into the disharmony of the random, as a rule, is the product of scholastic, eclectic thinking. But the practice of more complicated management requires a profound understanding of Marx's dialectical method.

Economics, politics and ideology are three spheres that interact most actively. It is clear, for example, that the rate of progress along the path to increased effectiveness depends strongly on the completeness of the awareness of crucial tasks; without conviction there is no administration. It is no wonder that the decisions of the party and government concerning improvement of the economic mechanism coincided with the publication of another document--the decree of the CPSU Central Committee concerning further improvement of ideological and political-educational work.

Marxist dialectics are thus being applied in increasingly more diversified ways. Millions are mastering Marx's theory and method.

Modern history has increased its tempo many fold, and the course of time itself has been accelerated, which was discussed by Engels. Consequently it is necessary to make new efforts so that the random element does not assume excessive influence over events. Marx thought that people's ability to exert a planned influence on the course of social development and to rule over random things will increase. Marx regarded capitalism as the field of action of "statistical" laws. They are realized in the mutual extinguishing of individual deviations in one direction or another, "individuality is subordinated to randomness."⁹

The tendency toward planned action, proportionality and harmony in development reflects the humanistic strivings of socialism. Marx and Engels had a profound belief in people of the future. Regarding Kautsky's attempts to create pharmaceutical formulas for the future, Engels sharply noted: "People in a communist society will decide themselves . . . I do not consider myself called upon to suggest anything to them or give them the corresponding advice. These people in any case will be no more stupid than we are."¹⁰

Today's blossoming of interest in economic theory is predictable. It is related not only to the persistent demands of the day, but also to the new, objectively appearing possibilities. Two circumstances are decisive here. First, a number of countries of the socialist community are today experiencing an extremely similar stage in their development: they are realizing Marx's thesis concerning practical and theoretical cooperation among the most leading countries.¹¹ A remarkable opportunity has arisen to compare the paths and forms of solutions to various kinds of problems under socialism in different conditions.

Second, there is an increasingly clear awareness of the need for special efforts in order to surmount those difficulties which are related to certain forms of administration, planning and stimulation that lag behind the level of productive forces. The points of greatest strain, the points of a certain aggravation of production relations, are important objects for scientific analysis of the patterns in the development of the socialist and communist economy.

Marxism teaches us to raise radical philosophical problems pointedly and to solve them without compromise. To consider the present comprehensively, to keep the past and future in mind, to see historical possibility clearly, and to actively use effective forces of history for transforming this possibility into reality--such, briefly, are the main principles of Marxist theory.

"The new forces of society, in order to have the proper effect, need only one thing: they must be mastered by new people, and these new people are the workers."

K. Marx

The power of Marxist thought corresponded to the force of the class, the cause it served. Having cast out young Hegelian prejudices concerning the uninspired crowd and the select bearers of "active spirit," Marx was able to understand the spirit of the masses, to see the real force which is capable of developing the most decisive revolutionary energy. He turned to the proletariat.

The guiding light of scientific and political analysis clearly illuminated the immense and growing social mass which concealed possibilities of purposive activity and practical initiative. Marx's thought embraced all aspects of the life of the proletariat--its traditions, the history of its social development and its spiritual strivings. He saw in the workers comrades who were capable of broadening the limits of the possible in changing the world.

Being a proletarian himself in terms of his views and his way of life, Marx walked shoulder to shoulder with the workers. Recognizing the conditions of life and liberation of the workers, Marx taught the proletariat self-awareness. He laid the basis for the process of the proletarian interpretation of its social mission. Life sharpened the ability of the proletariat to think theoretically.

"The working class," Marx declared decisively, "is either revolutionary or nothing."¹² Having joined the workers together by a unity of goals, Marxism called upon them to fight. The "Communist Manifesto" is permeated with the rebellious and creative spirit of the class struggle. Only in political battles is the proletariat capable of recognizing itself. Only in the magnetic field of the class struggle is it possible for it to be transformed from a class-in-itself into a class-for-itself.

Marx felt the deepest sympathy for the workers although, since he did not like sentimentalism, he never spoke of this. He was far from being a guardian of his class. Independence of thinking--this is what he especially valued and persistently developed in the proletariat. Marx understood independence of thinking as the leading indicator of the theoretical and political culture of the class, as a decisive condition for the firmness of its socialist convictions.

A constant striving for self awareness, a will to struggle, and independence of class thinking and behavior--these features were embodied for Marx in the communist party, the most active part of the class which was the most aware and critical of reality.

Marx was the first to formulate, justify and realize the life-giving principle of proletarian solidarity. The Internationale became the embodiment of the keen and decisive communist awareness of the workers. In Marx's words, the international fraternity of workers has identified itself with the working class.¹³ The great political and moral force of the general European and world significance, the Internationale expressed the planetary community of

interests of the working class. Engels wrote about the numerous threads from all countries which "voluntarily came together in Marx's office."¹⁴

Marx devoted his life to the cause of the historical rise of the working class. Economic categories, compressed and filled with intellectual energy of Marxist formulation explained the conditions of the existence of people, outlined the vital routes of the immense social collectives and inspired them to struggle. Marxism announced the real meaning of the life of the individual worker: not the acquisition of means of existence, but self-liberation.

In 1894 a correspondent from one of the new socialist weeklies went to Engels who was seriously ill, but had not forfeited his impressive creative activity. The journalist asked him to formulate the basic idea of the future era in opposition to the capitalist one where, in Dante's words, some people rule while others suffer. To present the meaning of the teaching in one line? Engels, unafraid of aphorisms, answered skeptically: "To formulate in a couple of words the idea of the future new era without falling into utopianism or into simple phrase making is almost an impossible task."¹⁵ But still Engels finds the cherished line in the "Communist Manifesto": communism is an "association in which the free development of each is a condition for the free development of all."

True to Marxist tradition, the party is constantly turning to the class which "stands in the center of one age or another, determining its main content, the main direction of its development and the main peculiarities of the historical situation" of the given age.¹⁶ This is precisely the way the 26th CPSU Congress develops the understanding of the role of the working class in a mature socialist society.

Materializing the achievements of the scientific and technical revolution in their activity and being the first productive force of society, the working class concentrates in itself two main sources of advancement of socialist production--science and man. Even capitalism includes the ability to work as a part of productive forces, but this is dictated by the systematic utilization of man as a means of self-growth of capital. The main character in the world historical drama, the working class, is joined together not only by the rejection of capitalist reality. It seriously and decisively demands the proclamation and development of a new, communist ideal.

Developed socialism requires further concretization of ideas about the communist idea. For capitalism man is a universal means. For communism he is a universal goal. Man in all his wealth and the brilliance of his intellectual, physical and moral qualities is the main and essentially the only worthy goal.

The interest of the 26th Party Congress in man alone is remarkable. Man, his needs and interests, his capabilities and talents--these are truly the central point of the Congress analysis. The effectiveness, quality and intensification of production and labor productivity are so greatly significant precisely because they are the essence for the means of achieving the goals of the age--the strengthening of the positions of real socialism and hence of peace, the creation of a classless society, and the all-around flourishing of the individual.

Marx envisioned the new society as a wealth of highly developed collective ties. The working class reflects in a concentrated way this all-penetrating Marxist teaching of the idea of collectivism. The present day orients people toward the ability to arrange life on a profoundly collectivist basis. The closer we are to comprehensive realization of individual human potential, as Marx and later Lenin foresaw, the more the rights of the collective expand with respect to the individuum.¹⁷ Such are the dialectics of social life.

The economic conditioning of collectivism is more definite today than it was yesterday. It is no longer only theory, but also ordinary common sense that registers the process of strengthening of the mutual dependency of people in public production. Division of labor is becoming deeper, its collectivization is growing, and an increasing number of final products are becoming the embodiment of labor of immense collectives and have the stamp of the labor efforts of tens of thousands and sometimes millions of people. The worker either confirms through his concrete labor the collective efforts, or reduces the labor of others to nothing if he performs one technological operation or another poorly, without quality or in an unskilled way.

The historical acceleration of communism is determined by how completely its collective capabilities and individual capabilities of each man are realized. Even today the free development of each individual (and what is freedom if it is not the ability to foresee the inevitable consequences of one's own actions?) is a condition for the free development of all. Another aspect of the matter which was sharply emphasized by Marx and Engels is growing in significance: "Only in the collective is personal freedom possible."¹⁸

Marx saw in the proletariat a class in which "the revolutionary interests of the society are concentrated,"¹⁹ the interests of all mankind and our destiny. The future of mankind is firmly linked to the working class. Only its contemplation of the world corresponds to man's striving for humanity.

"The ideas which seize our thought and take dominion over our convictions, to which reason welds our conscious--these are bonds which cannot be broken without tearing apart our hearts."

K. Marx

Time increases the significance of Marx's moral example. Interest in Marx's life and struggle is increasing. They are perceived as concrete moral reference points.

With the appearance of Marx's revolutionary theory mankind was faced with a choice for the first time: to allow reality to absorb him or to subordinate reality to himself. Marx himself was a man of action. While appealing to reason, he called for action. Marx juxtaposed the active position of the scholar and citizen to the inactive dissatisfaction and passivity that was typical of his educated contemporaries, which he found unacceptable even from a purely aesthetic standpoint.

His own actions were zealous. He worked with persistence and concentration on explaining such economic, social, political and other relations, when conscious can be active, reason can be strong and free, and human life can be fruitful.

For Marx as for the best of the proletariat, boldness, awareness of one's own worth, and a feeling of pride and independence were more important than food. Like the best of the proletarians he experienced from revolutionary activity "the greatest enjoyment in life."²⁰ Hence his love of life and confidence in victory.

He justifiably valued highly the conviction of a revolutionary period. Marx wrote about one of his party comrades: ". . . he is an understanding man, profoundly honorable, prepared for everything, capable of self sacrifice and-- what is most important--he has conviction."²¹ Marx found that great talent without conviction creates scoundrels.²²

He never stood in the middle of the road. Having recognized the conditions and the direction of the struggle, he considered himself obligated to proceed to the end, until all possibilities and all changes of victory were exhausted. The aggressive manner of action required a good deal of moral courage. Through the twists and turns of the revolution with its rapid changes of events, unexpected happenings, explosions, through the backwardness and torpor of counter-revolutionary periods, through the timelessness of political stagnation, Marx proceeded directly and in a worthy manner, displaying a wholeness of thought, feeling and action which defeated enemies and inspired friends. Attending to the tortuous and disturbed course of history, he retained confidence in principles and the revolutionary goal.

"I work a colossal amount, usually until 4 a.m.," he wrote to Engels on the day of the creation of the "Economic Manuscripts," which included the main tenets of his political economy. "It is quite necessary for the public to reveal the very basis of things."²³ And again: "I work like a madman all night long on summing up my economic research so that at least the main issues will be clear before the flood."²⁴

Posterity knows the energy and the firm awareness of his own worth with which he worked on "Das Kapital." But there is so much bitterness in his magnificent "nothing human is alien to me," for it was so difficult to engage in daily battle with necessity, with disease, with the "most common daily trivia." "There has hardly been a book that was written under more difficult conditions," Jenni Marx told Kugelman, "and I could write the entire mysterious history of its creation, which would reveal a great deal, an infinite number of hidden concerns, alarm and torment."²⁵

Having proved that the boundaries within which people act as creators of their own life and their own destiny can and should be expanded, Marx summoned them to struggle. Marx's moral example shows the unique possibilities of the individual in the revolutionary cause. Indeed, the individual is capable of developing truly superhuman energy. It is provided by reliance on the class, action on behalf of the class and the ability to condense the spiritual forces of the class.

Marxism was the first to organically unite the political and moral awareness, a political and moral sense. His moral sense motivated the young Marx to commit himself to the side of the insulted and the injured. It dictated to

him the first definitions of the revolutionary-democratic ideal. Having discovered that "morality is not inherent in the state, and the state is immoral,"²⁶ he began to search for paths to the society which would be "a union of people who freely educate one another."²⁷

The history of the spiritual development of the young Marx is a picture of rapid and confident movement from ethics to politics, from a critical evaluation of the interrelations of people in all of their imperfection to an evaluation of the interrelations of classes with their rigid conditioning by factors which are primarily of an economic nature. Marx traveled the path of immersion in social life, a path filled with profound dialectical searches and generalizations. A conclusion followed predictably: only the revolutionary activity of the masses can resolve the tragic collisions of human life.

He soon gained a clear understanding of the fact that the common human ideal cannot be realized within a bourgeois society. An advanced representative of human reason, Marx was especially critically aware of responsibility to future generations. Drawing people's attention to the future, he persistently pointed out elements of the future in the present. The future became tangible.

"The truth is universal, it does not belong to me alone, it belongs to everyone, it masters me, and I it."

K. Marx

"I hope to achieve a scientific victory for our party."

K. Marx

It is justified to speak about the predictable humanization of science. Modern science is oriented toward the interests of man. The proclaimer of this approach was Marx.

He combined a passion for research with a cold-blooded and implacable objectivity in thinking. A real scientist, he was free of any attendant considerations. In his mind charlatanism in science merged with political time-serving. He could not separate the "spirit of generalization and revolutionary passion."

The paradoxical nature of his thinking was rooted in the very nature of creative research and was strictly limited: "Similar to the way when examining a picture it is necessary to leave the place from which one can see on the picture only holes and not colors, only disordered interweaving lines and not figures--similar to this it is also necessary to leave a point of view from which the world and human relations are visible only from their external sides."²⁸

Marx perceived science as a powerful creative force which is capable of changing the world. The remarkable 11th thesis about Feuerbach ("Philosophies only explain the world in different ways, but the point is to change it"²⁹) pertains not only to philosophy. To no less a degree it also pertains to science as a whole.

"For Marx science was a historically moving, revolutionary force," said the already grey Engels in his severe and beautiful speech on the day Marx was buried, 17 March 1883.³⁰ Engels also discusses that vital joy which provided

his friend with each success in theoretical thought, Marx's creative contribution to various areas of human knowledge. But most of all he was to speak about the quite special feeling aroused in Marx by discoveries that revolutionize production and human development in general. The future will respond to these dreams with impressive scientific results; the fruits of the transformation of science, acting as the spiritual potential of production, into a direct productive force, into one of the leading productive forces of the society, are inexhaustible. The scientific and technical revolution will accelerate many fold the revolution of man himself.

Marxism considers the experience in the development of the productive forces of mankind to be one of the leading criteria for the truthfulness of human thinking. With the establishment of industrial technologies the significance of this criterion increases. Production educates people in the spirit of greater and greater respect for science.

"The dialectics of material transformation" is achieved not only in the scientific laboratory, but also in the modern plant. During the course of the strengthening and expansion of ties between science and production, during the course of the movement toward scientific production complexes on a national and international scale and level, mankind becomes something like a collective participant in an immense research process. These all-embracing changes are accompanied by further revolutionization of social awareness. Largely thanks to science, the socialist society is being transformed into a kind of research laboratory--a consolidated collective, acting with coordination, solidarity and awareness in all of its elements.³¹

The progress of science and the progress of democracy are essentially the same thing. Only as a blind, unrecognized "need-in-itself" is transformed into a "need-for-us," does human freedom expand, and the possibility of acting in keeping with the objective law of social life is transformed into a reality.

"Nature is magnificent . . . ," noted the old Engels, magnificent himself, like nature, armed with all of his experience and knowledge. "But history seems to me even more magnificent than nature. Nature required millions of years to engender beings that are gifted with awareness, but now these aware beings require thousands of years in order to organize joint activity consciously: being aware not only of their actions as individuals, but also of their actions as masses acting jointly and achieving together a previously set common goal. Now we have almost reached such a condition."³²

Marxism opposed to the random and unsystematic nature of the bourgeois world view, a dynamic, critical and consistent system of views. For the first time in history the fate of millions of people--the body politic--has ceased to be a series of improvisations and intuitive acts. Politics has begun to be based in science, and to a certain degree has included science in itself.

The consistently democratic forms of the state life of the people are continuously being enriched.³³ The striving for further democratization of all aspects of life is becoming one of the most important characteristics of developed socialism. "Ever increasingly broad participation of the workers of all nationalities in the control of public and state matters," noted General

Secretary of the CPSU Central Committee, Comrade Yu. V. Andropov, in the report entitled "60 Years of the USSR," "--this can characterize in the most compressed form the leading tendency of our political life."

An essential condition for socialist democracy is harmony and coordination of interests. Correctly understood interest always lies at the basis of morality. With a reasonable structure, Engels noted, science counteracts a breaking down of interests.³⁴ Thus politics, science and morality are brought into the same focus.

"History is nothing other than a continuous change in human nature."

K. Marx

Penetrating the scientific and political significance of Marx's ideological legacy, the historical importance of his living example, one turns to the age he heralded. To modernity, when "those industrial and scientific forces, whose existence was not suspected in a single preceding epoch in the history of mankind, came to life."³⁵ The need for outstanding individuals was inherent in it no less than in preceding epochs. But the main indicator of our time is the awakening of the historical energy of the peoples.

The richer the historical experience of the millions, the stronger the influence of Marxism on their awareness. Marx's teachings have become a decisive step in the spiritual development of mankind. They have withstood the test for reliability in the most critical moments of its development. Humanity is obligated to Marx for a qualitative leap in political and moral awareness.

Marx foresaw and had presentiments about the infinitely diverse and intensive rhythms of the 20th century and the historical acceleration inherent in it. "We are faced with the most revolutionary period that mankind has ever had to experience," he wrote to Jenni Longuet in 1881. "It is now bad to be an 'old timer' and have only the possibility of foreseeing instead of seeing for oneself."³⁶

The modern bourgeois world is in the grip of a profound historical pessimism-- "disenchantment with progress," "a shock of the future," and so forth; the bourgeoisie can no longer find within itself sufficient intellectual and moral resources. But for the people of developed socialism the words of the great Marxist, V. I. Lenin, are becoming increasingly crucial: "We must manifest ourselves . . . before all the world . . . as a force that is capable of providing an example."³⁷

The successive series of human generations continues the assimilation of the creative legacy of Marx. The destiny of a genius is impressive--to live after death with growing intensiveness. On holidays and other days of history Marxism will serve as a powerful weapon in the liberation struggle of mankind, raising more and more segments of society to the peaks of social awareness, to a conscientious attitude toward reality. A new type of human culture has crystalized in Marxism.

FOOTNOTES

1. Marx, K. and Engels, F., "Soch." [Works], Vol 3, p 70.
2. Lenin, V. I., "Poln. sobr. soch." [Complete Works], Vol 44, pp 228-229.
3. Marx, K. and Engels, F., "Soch.," Vol 29, p 212.
4. Quoted from Lenin, V. I., "Poln. sobr. soch.," Vol 29, p 266.
5. Marx, K. and Engels, F., "Soch.," Vol 16, p 199.
6. Marx, K. and Engels, F., "Soch.," Vol 33, p 279.
7. Lenin, V. R. "Poln. sobr. soch.," Vol 36, p 171.
8. Marx, K. and Engels, F., "Soch.," Vol 4, p 299.
9. Marx, K. and Engels, F., "Soch.," Vol 3, p 440.
10. Marx, K. and Engels, F., "Soch.," Vol 35, p 124.
11. Marx, K. and Engels, F., "Soch.," Vol 16, p 12.
12. Marx, K. and Engels, F., "Soch.," Vol 31, p 396.
13. Marx, K. and Engels, F., "Soch.," Vol 16, p 445.
14. Marx, K. and Engels, F., "Soch.," Vol 36, p 18.
15. Marx, K. and Engels, F., "Soch.," Vol 39, p 167.
16. Lenin, V. I., "Poln. sobr. soch.," Vol 26, p 142.
17. Lenin, V. I., "Poln. sobr. soch.," Vol 6, p 345.
18. Marx, K. and Engels, F., "Soch.," Vol 3, p 75.
19. Marx, K. and Engels, F., "Soch.," Vol 7, p 16.
20. Marx, K. and Engels, F., "Soch.," Vol 6, p 601.
21. Marx, K. and Engels, F., "Soch.," Vol 31, p 245.
22. Ibid., p 367.
23. Marx, K. and Engels, F., "Soch.," Vol 29, p 192.
24. Ibid., p 185.
25. Marx, K. and Engels, F., "Soch.," Vol 31, p 500.

26. Marx, K. and Engels, F., "Soch.," Vol 1, p 345.
27. Ibid., p 103.
28. Marx, K. and Engels, F., "Soch.," Vol 1, p 54.
29. Marx, K. and Engels, F., "Soch.," Vol 3, p 4.
30. Marx, K. and Engels, F., "Soch.," Vol 19, p 351.
31. Lenin, V. I., "Poln. sobr. soch.," Vol 54, p 311.
32. Marx, K. and Engels, F., "Soch.," Vol 39, pp 55-56.
33. See Lenin, V. I., "Poln. sobr. soch.," Vol 21, p 93.
34. See Marx, K. and Engels, F., "Soch.," Vol 1, p 555.
35. Marx, K. and Engels, F., "Soch.," Vol 12, p 3.
36. Marx, K. and Engels, F., "Soch.," Vol 12, p 3.
37. Lenin, V. I., "Poln. sobr. soch.," Vol 42, p 28.

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CSO: 1820/129

SCIENTIFIC-TECHNICAL PROGRESS VIEWED IN CONTEXT OF MARX'S WRITINGS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOG; PROIZVODSTVA in Russian
No 5, May 83 (signed to press 11 April 1983) pp 22-32

[Article by A. P. Leont'yev, candidate of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "K. Marx on the Unity of Scientific-Technical and Socio-Economic Progress Under Socialism"]

[Text] Scientific and technical progress is the main source of intensification of public production and its increased efficiency. The November (1982) Plenum of the CPSU Central Committee pointed out that the large reserves at the disposal of the USSR national economy must be found in the acceleration of scientific and technical progress and extensive and rapid introduction into production of the achievements of science, technology and advanced practice.

The increased rates of scientific and technical progress in a socialist economy presuppose a study and a conscientious utilization of objective tendencies toward integration of science and production and the profound internal laws of their development. The fundamental works of K. Marx therefore become especially important, where he gives a methodology for solving problems raised by modern social practice.

"The Economic Manuscript of 1857-1858"

The manuscript contains extensive material about the role of science in the development of public production. K. Marx wrote here about a scientific combination of people and machines, about science as the most basic form of wealth, about the public and scientific nature of free labor, about production as the technological application of science, about placing science in the service of human needs, and so forth.* K. Marx saw in science a powerful social force which, with the transformation of production, changes from being subordinate to capital to serving combined free labor.

The social force of science is embodied in machines (under capitalism--mainly in capital). Predicting the social results of the development of scientific

*Marx, K. and Engels, F., "Soch." [Works], Vol 46, part 2, pp 21, 33, 110, 206, 208.

knowledge, K. Marx wrote: "The development of basic capital is an indicator of the degree to which general social knowledge (Wissen) has been transformed into a direct productive force, and hence it is an indicator of the degree to which the conditions of the vital social process itself is under the control of the general intellect and is transformed in keeping with it; the degree to which public productive forces are created not only in the form of knowledge, but also as direct agencies of social practice, of the real process of life."*

Literature frequently gives the first part of K. Marx's thesis--about the transformation of science into a direct productive force, without the second part--about the control of social awareness of the social practice of transformation of social relations. Yet, as one can see from the context, both assertions are organically interconnected. We are speaking about progress in productive forces and production relations that is conditioned by the development and application of science, about the mutual dependency of scientific-technical progress and scientific control of the economy. With the utilization of the achievements of science and technology in production the level of its real collectivization rises sharply and changes occur in economics, organization and administration.

What is the degree of real embodiment of new productive forces that originate with scientific and technical progress? The answer to this question is given by the control of the workers over the transformation of science into a direct productive force. This control is effective if it, in turn, relies on science, since science itself is already a form of social awareness and social control over the development of the conditions of the life of the people, including in the sphere of public production. Integration of science and control of the workers contribute to progress both of productive forces and of production relations. Economic decisions made under these conditions can then acquire such an internal force that no external obstacles can stop them.

"Economic Manuscript 1861-1863"

K. Marx considered here the main forms for increasing the productive force of labor: cooperation, division of labor and machines, that is, the application of scientific knowledge.** The largest amount of space--more than 200 pages--is allotted to the question of machines.

K. Marx studied the history of machine implements of labor (scientific, technical and economic prerequisites for their appearance, their creation and development, and prospects for their application), explained their socio-economic essence, showed the purpose, conditions, economic effectiveness and socio-economic consequences of the application of machines under capitalism, and revealed the revolutionary significance of science. K. Marx accompanied the investigation of these questions with a consistent criticism of the bourgeois theories of the application of machines under capitalism.

*Ibid., p 215.

**See Marx, K. and Engels, F., "Soch," Vol 47, p 284. Henceforth references to this source are given directly in the text of the article.

Speaking about scientific, technical and economic prerequisites for the appearance of machines, K. Marx writes: "Machine labor as a revolutionizing element is directly brought into existence by a need that is greater than the possibility of satisfying it with previous means of production" (p 461).

K. Marx shows that the process of transforming science into a productive force is rooted in early stages of the emergence of large-scale public production-- simple cooperation and manufactory. It is impossible to move to a higher level of production without accumulating enough prerequisites in science, technology, organization, capacities and production structure. A contradiction between the new social demands and the previous capabilities of public production accelerates the change.

Developing the concept of the transformation of science into a direct productive force, K. Marx writes: "If the process of production becomes the application of science, science, conversely, becomes a factor, as it were, a function of the process of production. Every discovery becomes the basis for a new invention or for new, improved production methods" (pp 553-554). Large-scale production offers society means for developing science, and science becomes a factor in accelerated progress of public production.

K. Marx saw the socio-economic significance of machines and their essence in public production in the deliberate and active utilization of the forces of nature in production in order to satisfy needs and in order to increase the productivity of labor. The machine is a means of scientific control over natural processes that take place in production. "Mass production," wrote K. Marx, "cooperation on a large scale with the application of machines is for the first time being subordinated on a large scale directly to the process of the production of the force of nature: wind, water, steam, electricity, and it transforms them into agents of public labor" (p 553).

K. Marx pointed out the fundamental principle for determining the economic effectiveness of machines: a comparison of expenditures on the production of machines with the savings on labor achieved with their help. ". . . An effective machine, to the degree of its effectiveness, costs less than a less effective one does, that is, the quantity of working time required for its actual production increases to a much lesser degree than the quantity of working time which it replaces" (p 357). As a result, labor productivity increases and expenditures per unit of consumer value decrease. "As the effectiveness of a machine increases and as it increases the productivity of the labor force, in that proportion in which it makes it possible for one worker to perform the work of many workers--there is an increase in those consumer values and therefore in those goods which the machine is used to produce during the same amount of working time. Thus there is an increased quantity of those goods in which the value of the machine is again manifested" (p 358). The application of machines is therefore most effective in mass production.

Progress of science and technology plays an immense revolutionary role. K. Marx showed this, first, using the example of the breakdown of feudalism and the emergence of the capitalist method of production: "Gunpowder, the compass and the printing press are three great inventions which transformed the bourgeois

society. Gunpowder blows up the knights, the compass opens up the world market and establishes colonies, and the printing press becomes a weapon of protestantism and in general a means for the rebirth of science, the most powerful lever for creating the necessary prerequisites for spiritual development" (p 418). Second, K. Marx formulated the overall dependency between progress in science and in the economy: "Along with the revolution that once took place in productive forces, the technological revolution, there is also a revolution in production relations" (p 461).

The First Volume of "Das Kapital"

Questions of scientific and technical progress are discussed mainly in the large 30th chapter, "Machines and Large-Scale Industry." K. Marx concentrated attention on the specific forms and results of the application of machines under capitalism. But here to there are points and conclusions that characterize the overall process of the transformation of science into a direct productive force and certain of its features under capitalism.

The 30th chapter begins with an analysis of the genesis of machines. The historical and logical aspects are unified here; it becomes possible to give a scientific definition of machines that reveals their socio-economic essence: "As a machine an implement of labor acquires that material form of existence which brings about the replacement of human force with the forces of nature and empirical routine methods --through deliberate application of natural science."* One might therefore consider that the chapter on machines is a development of the thesis about the transformation of science into a direct productive force.

The appearance of machine implements of labor was prepared for by a change in the nature of production and, in turn, signifies a further deepening of these changes. The application of machines is the result of a particular level of collectivization of production and a factor in its further collectivization. "Machines," wrote K. Marx, ". . . function only in the hands of directly collectivized or joint labor. Consequently, the cooperative nature of the process of labor becomes a technical necessity here which is dictated by the very nature of the means of labor" (p 397).

The socialist (communist) form of public production corresponds to the social nature of machines. But machines were first applied under the conditions of capitalism since production is initially collectivized in capitalist forms and this is historically necessary in order to prepare for socialist collectivization. The dialectics of the transformation of science into a direct productive force is such that it begins in those forms and with those results which only prepare for the transformation of science into a direct productive force and the application of machines in keeping with their real nature. Science under capitalism becomes not only a direct productive force, but also a direct destructive force: "Capitalist production, consequently, develops technical equipment and the combination of the social process of labor only in such a way that at the same time it undermines the sources of all wealth: land and the workers" (p 515).

*Marx, K. and Engels, F., "Soch," Vol 23, p 397. Henceforth references to this source are given directly in the text of the article.

The progressive results of the transformation of science into a direct productive force are increased with the changeover to socialist machine production. ". . . From the first glance it is clear," wrote K. Marx, "that large-scale industry, having mastered the colossal forces of nature and science for the production process, had to increase labor productivity to an extreme degree . . ." (p 398). Increased labor productivity is the main economic result of the application of scientific knowledge and machine implements, and the other results are secondary or derived. Consolidation of production in itself also contributes to increasing labor productivity, but mainly because it creates conditions for the effect of a more powerful factor--the application of machines. ". . . The machine is the most powerful means of increasing labor productivity . . ." (p 414).

Increased labor productivity because of the application of machines is the essence of their economic effect. The economic effectiveness of machines is manifested in a distorted way under capitalism; it acquires its real form in the socialist economy: "If one regards machines exclusively as a means of making the product less expensive, the limit of their application is determined by the fact that the labor expended on their production should be less than the labor that is replaced by their application. But for capitalism this limit is defined more narrowly" (p 404).

The application of machines becomes a mighty factor in deepening public division of labor. "Machine production leads public division of labor incomparably further than manufactory does because it increases to an incomparably greater degree the productive force of the branches of industry it embraces" (p 455). Its influence extends also to international division of labor: "A new international division of labor, which corresponds to the location of the main centers of machine production, is created . . ." (p 462).

On the basis of the application of machines, increased labor productivity and deepening of its specialization a new, considerably more complicated, structure and organization of public production is formed. In order to achieve the goals here it is necessary to have new means, and administration of production assumes a scientific nature; otherwise the goals are not reached. "The principle of machine production--to break down the production process into its constituent parts and to solve the problems that thus arise by means of the application of mechanics, chemistry and so forth, in brief, natural sciences--is becoming decisive everywhere" (p 472). Continuing this thought, K. Marx writes in another place: "The spotty, ossified forms of the social production process, which externally appear to lack internal ties, are broken down into deliberately planned, systematically separated areas of the application of natural science, depending on the desired useful effect" (p 497).

One can say that in his research K. Marx approaches social production as a complex system whose goals and results of development coincide only because of the application of scientific knowledge in all spheres and at all levels of the national economy. The transformation of science into a direct productive force is not a partial process, but a universal one which transforms the economy as a whole.

The influence of the scientific and technical progress on the main productive force of society--man--makes it necessary to augment the integration of science and production (this was actually discussed above) with the integration of education and production. K. Marx expresses and develops these ideas in connection with the investigation of the law of the change in labor. "By means of introducing machines, chemical processes and other methods it (modern industry) constantly produces changes in the technical basis of production, and also in the functions of the workers and in social combinations of the labor process . . . therefore the nature of large-scale industry conditions a change in labor, an advancement of functions, and all-around mobility of the worker" (p 498). K. Marx calls this the "universal law of public production, and relations must be adjusted toward its normal realization" (p 499). As distinct from capitalism, the task of socialism ("like the issue of life and death") consists in "replacing [relative unemployment] with man's absolute suitability to changing requirements in labor; the individual worker, the simple bearer of a certain particular social function, is replaced by a comprehensively developed individual for whom various social functions are means of life activity that alternate with one another. . . . there is no doubt that the inevitable conquest of political power by the working class will win a proper place in the schools of workers for technological education, both theoretical and practical" (p 499). As a result of the transforming influence of science, the training and functioning of the labor force thus changes essentially and becomes more complicated, and new means, forms and methods are needed here.

Large improvements are also taking place in the interaction between industry and agriculture. As technological science is being applied in agriculture it is creating "material prerequisites for a new, higher synthesis--a union of farming and industry on the basis of their forms developing in juxtaposition" (p 514). Integration processes among science, education and industry are augmented by the combination of industry and agriculture; bases are appearing for a systematic approach to the control of the national economy.

The transforming influence of science on production is also manifested in the level of individual enterprises: in particular, in the appearance and development of a certain dependency between the sizes of enterprises and production organizations and the scope of application of science in production. K. Marx establishes this dependency when analyzing concentration and centralization of capitalism, but it is just as true for socialist production: "The increased sizes of industrial enterprises serve everywhere as an initial point for more extensive organization of the joint labor of many, for more extensive development of its material motive forces, that is, for progressive transformation of separate and routine production processes into socially combined and scientifically directed production processes" (p 642). This tenet of K. Marx will serve as an initial theoretical point for a broad program of measures for improving production organization at socialist enterprises in keeping with the needs and laws of the transformation of science into a direct productive force.

K. Marx's prediction about the sharp increase in the economic role of scientific and technical progress under socialism is coming true. As a result of the development of science and technology numerous new branches have appeared, and

traditional productions have changed in appearance. The USSR national economy annually assimilates a large number of new machines, equipment, instruments, materials and other products. Under the current five-year plan work is being done to implement 170 scientific and technical programs that are included in the State Plan for the Economic and Social Development of the USSR. Their main direction is the creation, assimilation and extensive introduction of new technical equipment and technological processes that provide for economizing on labor and material expenditures and improving the quality of products that are produced.

On the basis of technical progress the production capital of industry and other branches of the national economy is renewed, and existing enterprises are reconstructed and technically re-equipped. Capital investments used for achieving an increase in production capacities as a result of reconstruction and re-equipment of enterprises amount to about 24 billion rubles in 1983, which is 10 percent greater than the volume in 1982.

Still, the November (1982) Plenum of the CPSU Central Committee pointed out the need for further improvement of the entire complex of work related to intensification of production, including in the area of scientific and technical progress and its influence on the rates of growth of the productivity of public labor. The Plenum of the CPSU Central Committee demanded that we reveal and eliminate specific difficulties which impede scientific and technical progress and create and develop methods of planning and means of material incentives that contribute to unifying science and production.

The works of K. Marx give an in-depth description of the main social prerequisites, forms and results of a limited unification of science and production under socialism. His ideas were given further creative development in the works of V. I. Lenin and in the activity of the CPSU and the Soviet state. Armed with the revolutionary Marxist-Leninist theory, the Soviet people for the first time in world history are successfully resolving the large problems of scientific-technical and socio-economic progress in their inseparable unity.

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TYUMEN NATURAL GAS DEVELOPMENT DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROIZVODSTVA in Russian No 5, May 83 pp 44-80

[Round-table discussion written up and edited by B.P. Kuttyrev, "The Price of Blue Gold: Round-Table by "EKO" in the New Urengoy"]

[Text] At the 26th Party Congress, it was stated that gas production in Western Siberia and its transport to the European part of the country is a very important part of the fuel and energy program of the 11th and 12th Five-Year Plans. Development of the fuel-energy complex was again singled out as a key issue at the November (1982) Plenum of the CPSU Central Committee. The growth of primary energy resources is planned to increase in 1983. Tyumen natural gas will play a dominant role in this process.

At the beginning of the 1970's, the task was posed of "gasifying" the fuel-energy balance; i.e., gas production (converted to oil) should exceed that of oil. A very important role in reaching this goal belongs to the Urengoy field, which should make a major contribution to the total national output of "blue gold". This is the first time that such a large-scale natural gas production center has been created near the Arctic Circle.

At the initiative of the editors of "EKO", the New Urengoy city Party committee and the gas production association im. Orudzhev, and with participation of a staff member of the paper SOVETSKAYA ROSSIYA directors of city and economic organizations, specialists and academicians held a "round-table" discussion of certain problems of bringing the underground wealth of the Tyumen North into national economic use. The discussion touched on the following main topics:

the future and development strategy of Urengoy;

improving methods of management and operation in the North; and

the relation between production and social development.

The meetings were conducted by deputy chief editor of the journal "EKO", Doctor of Economic Sciences, Professor B.P. Orlov. Participants were:

Ye.F. Kozlov, first secretary of the New Urengoy CPSU gorkom;

N.I. Dubina, second secretary of the New Urengoy CPSU gorkom;

I.S. Nikonenko, general director of the gas production association im. Orudzhev;

V.M. Igol'nikov, chief engineer of "Glavurengoygazstroy";

A.N. Silin, chief specialist of the Tyumen interdepartmental territorial commission of Gosplan;

A.V. Yazik, doctor of technical sciences, director of the Urengoy integrated scientific research expedition;

G.I. Yepkhiyev, chief of the joint department of VNIIPGazdobychi, presently director of the planning and budget group of the "Urengoytruboprovodstroy" trust;

V.M. Paradnya, director of the Urengoy department of VNIIPGazdobychi;

Yu.T. Ivchenko, director of the production association "Tyumenburgaz", presently deputy director of the production association "Nadymgazprom" for drilling;

V.M. Ishekov, chief engineer of construction administration No 58;

N.V. Minayev, crew leader of electric resistance welding operators "Sever-1" of the "Urengoytruboprovodstroy" trust;

V.Ye. Degtyar', secretary of the Komsomol gorkom;

A.A. Popov, director of the gorispolkom's internal affairs department; and

I.A. Ognev, staff correspondent of "Sovetskaya Rossiya" for the Tyumen oblast.

How to Develop the Region

[Question] "EKO": The Report of the CPSU Central Congress to the 26th CPSU Congress states that a task of primary economic and political significance is "...the rapid increase in the production of Siberian gas. The fields of the Western Siberian region are unique. The largest of them, the Urengoy one, has such discovered reserves that both the country's domestic needs and those of export, including to the capitalist countries, can be supplied for many years. Gas and oil production in Western Siberia and their transport to the European part of the country should become essential parts of the energy program of the 11th and 12th Five-Year Plans." Here, in the North, the first thing noticed is the tempos. By the end of the 11th Five-Year Plan, there will be more natural gas produced than oil for the first time in the country, even though the oil industry has been in business for over a century, and the gas industry has only been around for forty years. Urengoy is given a key position in the gas industry by the 1985 plan. What particular features of the field could you point out?

[Answer] I.S. Nikonenko. Urengoy's gas reserves are vast. Together with the fields of Medvezhe (developed first in the northern Tyumen oblast), Yamburgsk and Zapolyarnyy, they constitute a substantial portion of the national reserves. The first economic complex was the Nadymskiy industrial center. An integrated home-building factory has been created there, with a capacity of 70,000 square meters of housing space per year. Construction collectives have been formed, and thus there is a base for developing the Medvezhe field. It has become a unique testing ground for trying gas production technology under the conditions of the Far North. For the first time in the world, problems of drilling large-diameter boreholes under permafrost and high gas temperature conditions have been solved; plants for integrated gas preparation (UKPG) with a high unit capacity (10-15 million cubic meters processed) are in use; a block-set method of building these plants and their long-distance transport have been mastered. Medvezhe reached its rated capacity in 7 years.

[Question] "EKO": The main question for our consideration is: what will be the future strategy? The volume of production is growing continuously. The volume and rate of growth of construction, number of workers and social infrastructure all depend on it. This determines the solution of lesser, but more immediate questions: repair equipment on site or take it back West? produce motor fuel here or import it? bring people in on a temporary basis or establish them comfortably at the production sites? and so forth. The production rates of natural resources at the field also determine the city's population, and its living conditions.

[Answer] I.S. Nikonenko: Over one-third of the country's gas was produced in the northern Tyumen oblast by the end of the 10th Five-Year Plan. In 1978, the investment activity center began to move to the Urengoy field. The experience at Nadym has made it possible to shorten the stage of its experimental industrial operation. In 1979, the volume of capital investments utilized here equalled that for equipping Medvezhe, and was double it by 1980.

According to the plan, gas production is to rise continuously. Our advance is going both toward the North and into deeper layers.

The constantly rising growth rates of production are an important feature of the field. For example, at Shebelinke, where I used to work, about 10 years were needed to produce less than only one year's growth at Urengoy. And our rates will increase in the future. The scale is unprecedented; the gas output task is even greater in the long term. This is difficult, but the work of transport, energy and other service sectors is improving, meaning that the production plans can be fulfilled.

[Answer] Ye.F. Kozlov: By the end of 1985, gas production in Western Siberia will grow to 330-370 billion cubic meters. This will create changes in the city's general plan. We are barely able to review them. In the long term, the population of Urengoy will be 130-150,000, with the first phase at 100,000. The figure discussed was much less until quite recently. At such rates, it's hard to speak of any individual "bottlenecks". Without a forward outlook and long-range planning, any sector can become a bottleneck...

[Question] "EKO": Generally, when one talks of the long run, present difficulties are not forgotten. In fact, they are discussed first of all. Ivan Spiridonovich, you began with the improving conditions. Why?

[Answer] I.S. Nikonenko: We'll find time to talk about the difficulties later on. But we shouldn't begin with them. Optimism plays a leading role in a large undertaking. And sometimes it's not good to complain. Was it really so long ago that the first team landed at New Urengoy, on a bare area overgrown with reindeer moss? But behind us was Nadym, with a certain potential that it shared with us. In addition, our construction site, with a capital capacity even greater than that of the BAM, is receiving the support of the entire country. Production crews are handling their jobs; we're even slightly ahead on the production. There is full mutual understanding between the producers and Minneftegazstroy SSSR and geologists. If the same could be achieved with other departments as well, notably those in the power industry and transport, then the gas workers' achievements would be all the more noticeable.

But speaking of difficulties, they are primarily related to the remoteness of our site, the harsh climate, and the underdevelopment of the region.

[Answer] Ye.F. Kozlov: Almost all the fields of the Tyumen oblast are at the Arctic Circle, in the permafrost region. Over 10% of the year the air temperature is below -40°C , with winds around 18 m/sec. Doctors speak with restraint about the area of the Urengoy field: "Limited suitability for permanent residence of the population..." The population must be rotated. But the result is a major rise in cost; the necessary living conditions become more expensive.

It is very difficult to restore the arctic tundra after the cover has been disturbed. Neglect of the environment can result in a reduction in reindeer herds, decline in fish yields and drop in fur production. Maintaining the ecological balance in the Urengoy field area means spending 2-2.5 times more for nature conservation measures than, for example, at the Orenburg gas condensate field.

[Answer] I.S. Nikonenko: the costs of maintaining roads under permafrost conditions are high. Industrial and civilian construction is considerably more expensive than in moderate latitudes. The North requires new management methods, new technology, new people for its accelerating development. We're not in the Northern Caucasus, but in the Northern Arctic Circle... Navigation does not last long here, 110 days. Cargos are basically delivered by water. The permafrost goes down 40 meters. Gas wells are technologically more complex than oil ones. The slightest disturbance in the conditions leads to complications. We are now advancing toward the north, to Yamburg. The frozen ground at Urengoy is -2°C ; there, it is -12°C . We must look at both if we are to avoid problems. But we are psychologically prepared for these difficulties. For us, the season favorable for work is winter. We are gradually acquiring experience in drilling under permafrost conditions. Institutes are helping, and I feel that the problems are surmountable. The field is also valuable in that it is a multiple-strata one, like a multilayer cake. So far, we have "bitten off" the top, developing the Senoman reservoir to a depth of 1200 m, which contains primarily methane. We are now beginning to drill another stratum: the Valanginian, containing condensate and oil.

[Question] "EKO": What special features occur in developing the "multilayer cake"? This probably requires special technical, technological, economic and other solutions?

[Answer] I.S. Nikonenko: The condensate accompanying gas is an important raw material. We are familiar with its production technology. But the issue of the directions of utilization must be resolved. The railroads are not handling the planned volume. If a condensate line is built to Surgut, the same problem will arise there. Everything depends on Gosplan.

[Answer] Ye.F. Kozlov: We burn up a large amount of motor fuel in the North. It would be good to take the initiative and process condensate locally. Creating refining plants at the production site will yield a huge economic effect. For now, we are carrying raw material there, and fuel back, losing millions of rubles in transport, yet even so we are not moving everything required in the amount needed. There will be a shortage of engine fuel starting in April. Starting up condensate production, it is already time to carefully think through the strategy for its use. We have little time left.

[Answer] I.S. Nikonenko: I think that this issue of processing condensate can be completely resolved locally. We have done a few things to solve it. For example, a small condensate refining plant is operating. The production volume is small, but all the boilers have been switched to it. We are importing less diesel fuel. We have repeatedly told scientific representatives that large plants with a complete technological cycle aren't needed. Mobile plants enabling builders to work quickly are sufficient. We put ours together in pieces within four months. If it were a modular design, we could do it in a matter of days. The wells are there; the raw material is under our feet.

But there is another aspect. With respect to the long-range future of Urengoy, many development questions come together: specialization, or multiple-sector production in the North? import resources, or self-sufficiency? and so forth. The fuel problem is thus a strategic one, related to the dilemma of creating large cities or using the expedition-temporary duty method.

[Question] "EKO": Isn't there one other aspect to be seen in these examples: that rigid constraints on resources push people to bold decisions? These could include production of motor fuel and local equipment repair.

[Answer] I.S. Nikonenko: Well, fuel for engines is an ordinary problem, at least compared with the major ones such as energy and transport. The volume of drilling is constantly growing; the borehole is going 2,800 m to the Valanginian; and energy consumption is high. I therefore agree that new, bold solutions should be sought. We are doing some things ourselves. There are also interesting solutions abroad. For example, we've come across a report that oil is being refined on tankers during transport. Bold, and original.

[Answer] Ye.F. Kozlov: In fact, experience suggests to us that original ideas are urgently required in the North. In technology, production organization, labor and management, economics, living conditions, and educational work.

Integrated Management

[Question] "EKO": What basic problems must be solved for the region's development?

[Answer] I.S. Nikonenko: There are several such problems. But we must start with management. Take transport, for example. The first condition for the fast, reliable development and operation of the field is roads. They must be at least a year ahead of the gas workers, but the opposite is the case. Production plans are frequently drawn up without taking this into consideration.

[Answer] Ye.F. Kozlov: We are building the tenth plant for integrated gas preparation, but the road only goes to the fifth one, though it should already be at the eleventh. This would save enormous work and resources. The railroad could have been completed in October 1981--there were only 15 km left--but there weren't enough cross ties! The siding is inaccessible--there aren't any roads. The road didn't reach the city until the second half of 1982. The experience of the past is that you can't begin production without roads.

[Answer] G.I. Yepkhiyev: The problem hinges on incomplete transport. The issue is currently being seriously discussed of large, and even superlarge units, of 120, 220 and 320 tons. There's nothing to carry them on. The appropriate all-terrain vehicles aren't available. The design of aerosleighs remains unchanged. A vehicle on an air cushion has been under development for over ten years.

[Answer] Ye.F. Kozlov: I think dirigibles are very effective in Siberian conditions.

[Answer] G.I. Yepkhiyev: Existing forms of transport are expensive. It's been estimated that about 3 million rubles a year are spent on water transport, with another 24-26 million on motor transport. Transporting part of this cargo from Tyumen and beyond to sites by air costs 34-37 million rubles. Not only that, it's not always possible to deliver a cargo to the opposite side of a river, due to bad weather. I think the future of Urengoy in the area of transport lies with dirigibles above all. Together with the railroads.

[Answer] V.M. Igol'nikov: When defining the long-range outlook, one should bear in mind that lack of coordination in the work of ministries, especially Mintransstroy, is determined first of all by shortcomings in planning. The capacities of transport builders and power engineers are such that few could compare with them. Why do they get to the field after us? Roads are vitally important to us--even without a hard surface, just ordinary ones. The country urgently needs gas. It would be easier for the country to do without 100 km of first-rate roads somewhere in the Ukraine or along the Volga. These kilometers save 200 heavy vehicles and some 50 units of heavy imported equipment a year. But how can the ministries be moved to transfer capacity here? Probably, the indices must be changed. The work of Mintransstroy should be evaluated not in volumes of construction and assembly work, but in growth of annual capacity, in cubic meters and tons of gas and condensate output. Then, the road won't hold up all the other work. It's very clear that individual managers avoid personal worries by placing departmental peace above national interests. Ultimately, the question must be clearly stated: decisions are made not by ministries, but by individual within them. And they can be held responsible.

[Answer] Ye.F. Kozlov: I agree. A certain volume of gas and oil is to be produced according to the plan. And this task should include in the plan the performance, for example, of a certain amount of transport work, including all forms of transport.

But it is just this approach which one doesn't see. River transport workers were already criticized at the 25th Party Congress, and they're just beginning to develop in our regions, lagging years behind the production schedule. The situation with railroads is no better. How many debates can be recalled, documents on building the line to Pangod (between Nadym and Urengoy) and from Pangod to Urengoy! But why wasn't the entire railroad system examined as a whole back in 1972? If they had gone to Salekhard, connected with Vorkuta, a lot of problems could have been avoided. Ministries would have been more than glad to go to the North. Rationalization of long-term development schemes, including those of transport, would yield a huge savings. For example, a square meter of housing in a "Leningrad" house costs almost 900 rubles. Parts arrive here from Leningrad after being transferred ten times! As a result, we don't receive at least 30% of the space. In other words, the transport system must be rationalized.

[Answer] I.S. Nikonenko: Development of Yamburg, north of Urengoy, is beginning. The conditions there are harsher. Over 2 million tons of freight must be taken there in 1983. This is the minimum to enable work to continue. Three would be better, and 5 with more northern regions. The railroad along the field as far as Yamburg and slightly beyond is a real proposal; large expenditures aren't required to build the road. Two parallel trunk lines, for power and the railroad, are vitally needed. Considering the experience at Urengoy, Yamburg could be developed several years earlier. We would very much like to have a scientific approach here, but the same old story is repeating itself: once again, they tell us that there are enough roads.

No, there aren't enough!

[Answer] Ye.F. Kozlov: It often happens that when the construction plan isn't fulfilled they point to a lack of resources, such as slabs. But even so they could move forward, by building roads with fill. Only now has a road trust been created in Nadym for the region; we're two hundred kilometers from there.

[Answer] I.S. Nikonenko: With the example of transport development, we have touched on a large, important problem in plan balance, in the supply of resources for basic activity. The main point is that insufficient resources are allocated for the tasks we are given. Logistics are behind. For builders, the solution to the problem lies in the block-set method, but they aren't furnished with the blocks. The dilemma is simple: without resources, we will either stand still, or inefficiently use our natural wealth. The second path is often chosen today. We are fulfilling the plan, although we're behind on startup of two plants for integrated gas preparation. But specialists believe that such "reserves" are nearing exhaustion. This means that the necessary resources and equipment must be obtained, even if not designed for Northern use (we almost forgot that; we would use anything for the construction). There must be a switch to modular construction, and railroads must be completed. The housing construction rate should be raised to 200,000 square meters a year. The problem is not manpower. Various ministries must turn their attention to Urengoy. For example, metallurgy should provide quality pipes. The management system should be raised to a higher level.

[Answer] I.A. Ognev: You mention the need to combine the efforts of all ministries. But how should this be done? What suggestions do you have for eliminating lack of departmental cooperation?

[Answer] I.S. Nikonenko: Even a simple combination of forces would yield much. For example, the situation with construction would undoubtedly improve greatly. Creation of "Glavurengoystroy" is undoubtedly a correct decision. Now, if resources are planned for Urengoy they will get there. Before, everything went in different directions. We sent a proposal to our ministry: create a unified infrastructure, so that there would be one boss over everything: drilling, and production; one purchaser for both industrial and civilian construction. It is pleasing to note that the issue is being handled positively. Our association is gradually concentrating the industries needed to obtain the final product: gas production. The experience of oil workers shows that they have uniform structures; the effect from association is obvious. Long-range plans can only be fulfilled by a united front. But there are still too many obstacles, although the Tyumen interdepartmental commission of Gosplan is helping us.

[Answer] V.M. Igol'nikov: I want to add an example. The efficiency of the sector's work depends above all on its material and technical base. Materials are supplied to us builders by river, and with several transfers. The result is that their cost doubles. We encounter considerable loss by assembling metal structures at gas processing plants, and only because they get there "in bulk". Preparation for assembly takes place on site. As spring approaches, everything gets bogged down in mud. If there were metal preparation bases at Urengoy and assembled blocks and pieces were delivered to the plants, then both materials and labor would be saved. The Tyumen interdepartmental commission of Gosplan has supported us. Mingazprom has approved our suggestions to create a large-scale repair station for heavy equipment and vehicles. There is a certain specialization by types of equipment; there aren't many different types of machines. For now, the repair shops will be combined, and specialized later. It's up to Gosplan. We did the calculations, and convinced ourselves of the advantage of creating a concentrated repair base. There is one objection: it will require people. But how many of them are now working at small repair bases?...

[Answer] Ye.F. Kozlov: From the management standpoint, there are two scenarios for the future development of our region: either with a concentration of efforts, or under conditions of traditional departmental insulation. The results will be corresponding. In the former case, there will be a single production-management structure for developing the Tyumen North; in the latter, on-going disagreements on one issue or the other are inevitable. Even in the current decade, an unconcentrated approach to development management can be expressed in a loss of several years. In other words, the country can be short several annual output volumes of condensate and oil if the departmental insulation is not overcome.

[Answer] V.M. Igol'nikov: For us, the final result is fulfillment of the plan. We will deliver the planned output volumes. The growths planned for 1985 will be attained; the basis for this exists. The well-known patriotic movement for a large increase in gas production per day will also aid plan fulfillment. The labor, resources and expenses this plan will be fulfilled with are another matter. We would like to have a more efficient development scenario.

[Answer] G.I. Yepkhiyev: When we plan long-range production and choose a management strategy, we know and are capable of quite a bit. But problems arise in the relationship of man with the environment, since it is simpler to think of the present.

From the standpoint of this region's future, for example, it is inadvisable to build sites without roads, since large areas are disturbed. This is quite visible when the tundra thaws. When part of the Urengoy-Nadym section went into production, deer migration wasn't taken into account. This probably could have been foreseen.

A good deal of concern is being expressed regarding warming of the ground along the gas line routes, but sufficient measures have still not been taken to correct the situation.

[Answer] A.V. Yazik: The quality of management decisions is especially important in an area such as environmental protection. We are presently seeing the large-scale impact of gas transport on nature in the Far North. Somewhat later, we will encounter the ecological consequences of releasing large amounts of heat into the atmosphere, as compressor stations go on line. For now, the main danger is in warming of the ground. Much attention is being devoted to this both here and abroad. Builders are making structures taking the permafrost into consideration, using it as an ally.

[Answer] I.S. Nikonenko: The quality of management decisions is especially important with fast tempos. There is an integrated program for developing Urengoy in the 11th Five-Year Plan and to 1990. It includes automation of production and control. If this requirement is not met, then our region will not have enough people to perform the tasks posed in the near future.

[Answer] Ye.F. Kozlov: Ivan Spiridonovich mentioned that the program exists. But a complete scheme for developing the entire field has not yet been compiled. In other words, there is not yet an overall management solution. But one is required, if for no other reason than that Urengoy holds gas, condensate and oil, with different departments behind them. Who will determine the overall development strategy? There will be a scheme, of course, but probably with a large delay. And one other thing. Let's even assume that the plan gets to the ministries and departments in accordance with the general program. But then the question arises of planning discipline, which is not always observed. Quality work is needed at all levels. It's hard to even imagine the economic and moral damage when a poorly welded gas line breaks. On the other hand, there is the quality of the management decision. Even a conscientiously welded pipe will break if the person who made it ignored the special features of northern conditions.

Practice, Science, Technology.

[Question] "EKO": Considerable experience has been acquired in developing the northern territories. What place does and should science occupy in this?

[Answer] A.V. Yazik: The role played by the gas industry in the national economy means that science has a particular interest in the sector's development. Institutes used to be created to solve the specific problems of each large gas field. For Shebelinka, with a production volume several times below that of Urengoy, there was VNIIGaz in Moscow, with its branch in Khar'kov, and institutes in Kiev and Donetsk. The Ukrainian Scientific Research Institute for Natural Gas was created, the Stavropol Scientific Research Institute in the Caucasus; development of Gazli is handled by the scientific research institute in Tashkent; there is one

in Orenburg. Without a scientific research institute, the optimum reservoir development cannot be determined, without mentioning solution of technical and technological problems. This is all the more true since Urengoy has raised several scientific and technical problems that are specific to the gas industry of the Far North. An institute is needed here in view of the volume and extent of experimental, drilling, testing and other work required, its scale and level. In our opinion, such a scientific research center for the sector should be created in Urengoy itself. It will largely determine the future development of the region.

[Answer] G.I. Yepkhiyev: There will be such a center if all the scientists already working here are brought together, and others invited; we know that there are those willing to come here. It should be created without delay.

[Answer] I.S. Nikonenko: It is very important to join forces in solving scientific problems. Various departments currently have 2-3 offices each in the city; VNIIPGazdobychi, TyumenNIIGiprogaz and other institutes have a number of small sections, subsections and sectors. Papers go from Urengoy to Leningrad, Saratov, all over the country, while we are left with numerous conflicts and agreements. If all the specialists could be brought together in one combined scientific research and design institute, I think that much could be accomplished. Existing young personnel are capable of solving greater problems the more they are joined together.

[Answer] Ye.F. Kozlov: We are awaiting from science a resolution of our special, northern problems. One must not go blindly here. For example, in housing construction.

[Answer] N.I. Dubina: Yes, special research is required for building each residential building, since permafrost, soft frozen ground and loam can all be under a foundation together. The trial and error method has a serious impact on people.

[Answer] Ye.F. Kozlov: Or take the fact that there hasn't previously been encountered in practice a similar combination of gas, condensate and oil. Which should be extracted first? This question should be answered looking a half century into the future. The answer will determine the kinds of cities to be built in the North.

[Answer] Yu.T. Ivchenko: Science is also design. For example, drilling must be designed considering timely exploitation of the field. Otherwise, and this does happen, the bases and equipment will be several years behind. Not to mention the design of living conditions, production organization methods, labor, management, and urban design.

[Answer] I.S. Nikonenko: What does it mean to act scientifically? First of all, not to repeat the mistakes of the past. We are presently working in harsh conditions, when one doesn't have a minute to reflect. Can one neglect breaking up firewood in such conditions? Yes! A chess player in time trouble must also hurry, but he moves the pieces according to a theory. And science must help the producer in time trouble, providing a plan sufficiently diversified for programs to be available to builders, drillers, well operators for any production growth rates, programs for urban construction and social services. Otherwise, everything is unexpected. There is a shortage of highly skilled assemblers. Everyone possible has been taken

from the areas with a falling gas production, but the shortage remains considerable. Science must prepare us for such a situation. We used to place our hopes on construction brigades; now, there is little hope on them. Who should have foreseen such a change? Science!

[Answer] Yu.T. Ivchenko: Difficulties can arise in the long run with the water supply. So far, natural sources have sufficed, but this problem is getting harder to resolve further to the north, towards Yamburg.

[Answer] I.S. Nikonenko: Hydrogeologists still haven't completely studied the contours. Explorers used to use external signs: here is a lake, there a stream, but that won't do from now on. The mechanisms of water behavior cannot be determined without science, especially since nothing is known about local reserves. We have an agreement with Khar'kov University. A large water line will obviously have to be built.

[Answer] Yu.T. Ivchenko: Oil men use special materials to build roads, but beyond UKPG-6 and UKPG-7 they are unsuitable: the frozen soil there is of a different type. Science should quickly work on finding an appropriate material, especially for creating drilling rigs designed for -45° .

[Answer] A.V. Yazik: A decision was made several years ago to cool transported gas, which will yield a considerable savings of energy. Two types of equipment were considered for this: first, turbo refrigeration plants, which appeared in the gas industry about 10 years ago; second, older steam compressor propane machines. Experience has been gained in the last five years in using both types. A comparison clearly showed the turbo refrigeration ones to be preferable. Installation was planned of 25 such machines to process all Buktyl gas. They will also be used for condensate.

[Question] "EKO": So there are no problems with cooling gas?

[Answer] A.V. Yazik: Not entirely. In 1977, the board of Mingazprom decided in favor of using turbo refrigeration plants in the sector. The design was created for the first station for cooling Urengoy gas, made by VNIPIGazdobychi. It was first attached to the first plant. Then, the station operated at the second, third, and finally the fourth integrated gas preparation plant. Everything went successfully. Everyone recognized that the tests went well, and in harsher conditions than those foreseen for their use. But imported propane machines were bought to cool gas from the northern part of Urengoy. In other words, a more expensive, complex and labor-intensive decision was adopted. Why? It's hard to say...Perhaps mistrust of new technology.

[Answer] V.M. Paradnya: For about four years I designed Buktyl stations with turbo refrigeration plants. It is hard to give up what one is accustomed to. But adjustment is necessary. These plants yield an additional 10-15 g of condensate per cubic meter of gas, a very considerable increase. Of course, in using the machines we lose a certain part of the gas for producing the energy to run them, but the loss is covered by the gain from the construction times and the additional amount of condensate.

[Answer] A.V. Yazik: Faster tests of such stations will allow use of the most progressive solutions at earlier development stages of deep Valanginian layers. More complete extraction of condensate will be possible. Somewhat less gas can be extracted from these layers by obtaining the planned volume of condensate, compensating the shortage by layers closer to the surface. This is an important advantage of this method relative to deep layers, especially in combination with other technological processes.

[Answer] I.A. Ognev: The production of gas, like oil, generally occurs in several stages. At the initial ones, the fuel comes from the ground by itself; then, it must be taken out by force. How are gas workers preparing for such long-range prospects of Urengoy?

[Answer] A.V. Yazik: Yes, this is an important issue. The technological problems related to cooling, compression and preparation of deep layer gas will make themselves felt later on. But then, they will start growing like a snowball. Gas cooling and treatment stations and powerful compression and main compressor plants will be required. We don't have them today, but tomorrow they will become the most complex objects from the standpoint of construction and operation. In addition, there are several specific problems that have arisen in Urengoy in the power technology field, which previously could not be modelled. There remains the path of experimental tests, whose results will be applicable for other fields. Sooner or later, the problem will arise of maximum extraction from the gas of heavy hydrocarbons and ethane, required especially for producing synthetic proteins; in other words, resolving the Foodstuffs Program. Ethane is extracted at minus 100-110°, so turbo cooling plants will again be required. This is indicated by world experience.

[Question] "EKO": What's the attitude here in the North to new technology, to innovations in general?

[Answer] A.V. Yazik: The attitude is good, but sometimes there is a vicious circle: the designers hurry to produce standard documentation. When one tries to make changes in it, no matter how progressive, one always runs into the fact that the documentation has already passed the expert appraisal and revisions are excluded, even though the proposed modifications are within the previous cost limits or yield a savings of capital investments.

[Question] "EKO": We have heard of very advanced technological designs for laying pipelines. This technology enables a savings of labor. But what is the situation with respect to its dissemination?

[Answer] V.M. Ishekov: Our construction administration No 58 is using three "Sever-1" complexes for resistance electric welding, produced by the Institute im. Paton. The institute is observing their operation on a stretch about 200 miles long, done by 2 crews.

[Answer] N.V. Minayev: Our crew welds joints in any weather. The difference between automated technology and conventional is that there doesn't have to be a person with a welding unit at each pipe joint. In place of the usual 80 persons in the crew, we have 24. This number also drops after the method is mastered. In general,

it's hard to compare, since there are completely different skills in the crew than with manual welding. Labor productivity is higher by a factor of five and more. The technology is excellent; it hasn't let us down once, and the process is possible at any external temperature. But here again there are man-made difficulties. The unit has thousands of parts, but there isn't the industrial basis for producing spare parts. Units stand idle literally for lack of the smallest screw. In one month we fulfilled four years' worth of manual welding assignments. And then we stopped...the allocated funds cover 20% of the need!

[Answer] I.S. Nikonenko: We urgently need "Sever" units, which make it possible to speed up production of gas transport arteries. It's up to industry not to delay production.

[Question] "EKO": The thought has been expressed that science does not cover the entire range of problems in development of the North. Methods are invented and tested, there are theoretical designs, but things slow down when it comes to embodying them in a specific machine or unit. But science is not only methods and technology. The organizational and management aspects of using a new method also need a scientific foundation. But so far, everything is left up to experience, which doesn't always yield the best result...

[Answer] Ye.F. Kozlov: It would be a mistake, of course, to simply complain. Let's look at the eighth or ninth gas refining units. They differ considerably from the first integrated gas treatment plants, mainly in their modular design. Powerful modular cleaning plants are already being produced at New Urengoy. The initiative here belongs to the first deputy minister of Minneftegazstroy SSSR Yu.P. Batalin. So there are certain accomplishments.

[Answer] V.M. Igol'nikov: The technical and technological foundation for raising the level of production and management does exist. A colossal leap has occurred before our eyes. UKPG-1 [integrated gas treatment plant-1] was built in 1978; UKPG-7, in 1982. During this time, costs per unit of output fell by half. The difference is even greater compared with the Medvezhe field. So, there is overall a visible strategy of producing more with fewer people. Mingazprom has done tremendous work in improving equipment, lowering its size and weight while increasing capacities. For example, there used to be a three-part process stage: separator, filter, absorber, in a 6 by 24 m unit. Now, the same unit is one column as a unit, with a capacity of 10 million cubic meters a day, in place of the previous 3-5. The area has been cut in half, and the configuration of all the "insides" has been simplified, yielding a considerable savings. Assembly quality has risen, since it is done under factory conditions.

Accomplished With Less

[Question] I.A. Ognev: We know that the greatest reserve lies in reducing the number of people working at secondary operations. What possibilities do designers, scientists and producers see here?

[Answer] I.S. Nikonenko: This strategic direction can't always be maintained. Besides the basic skills workers, integrated gas treatment plants now have fitters, instrument operators, and others. Not because that's the way we want it. Already,

at the current level of automation of production and control, 2-3 persons could be left at a plant. Repair work shouldn't be done at the unit. It should be done by request; repair workers should be concentrated at stations, so that only the engineer and an assistant remain at the unit. When the person on duty rings, a crew comes out and changes the faulty unit. But such a system is hampered by the lack of roads and bases. So, people have to be kept at the plant; otherwise, it can't be operated. At some point, only those people directly monitoring the technological process will remain at the integrated gas treatment plants.

[Question] I.A. Ognev: How does the number of personnel depend on the reliability of auxiliary equipment?

[Answer] I.S. Nikonenko: It might be difficult to call something auxiliary under northern conditions. If any part in the system breaks down, the whole system stops, and the country receives no gas. A cast-iron valve recently broke on a heat line at New Urengoy in the winter. With respect to gas production, this is auxiliary equipment, but the city had no heat or light for several days. People survived, but afterward the heat line and the ill-fated cast-iron part were still not categorized as basic. The repair was official: auxiliary equipment. But is anything more important than it?

[Answer] Ye.F. Kozlov: Many things have to be produced in twos and threes in the North. This will be justified. We all remember what happens when the power supply is cut off or there is a gas line accident. Reliability also means economy.

[Answer] I.S. Nikonenko: Construction norms and specifications should also be reviewed, at least occasionally, on the basis of high reliability of all proposals. This must be done to lower the number of workers.

[Question] "EKO": It's been said here that additional personnel must be kept at the plants to ensure reliability of the technological process. We've visited electric power plants and talked with the management. One has the impression that the number of personnel is extremely high. Moreover, it will be supplemented still more until the "quota" is reached. Could this be done to ensure "superreliability"?

[Answer] I.S. Nikonenko: You visited a back-up electric power plant, providing power when a power line goes out. Our sites must be ensured power reserves at the level of full requirements. The back-up plant was the subject of a dispute between two ministries. Minenergo agreed to maintain it on the condition that there be a 100-person limit. Yet next to it is a power plant of the same capacity, employing only three persons per shift. And they have 12 mW units, while ours are 2.5 mW ones, meaning that they're harder to operate. Nothing could be done. They were allocated "fat" limits, because they were afraid they might be let down. I might note in passing that each UKPG has a diesel back-up plant. The operation is highly automated; it takes only 22 seconds to switch the plant to diesel if a power transmission line goes out. Not one person is specially assigned for such a plant; the UKPG personnel are trained in power engineer skills. And the work is simple: two sectors perform absolutely identical functions, while the personnel quotas are entirely different.

[Answer] Ye.F. Kozlov: There is a reason why power engineers keep to their allowed limits. These reserves will later allow them to handle the needs of construction, the infrastructure, etc. Gas workers are in the same situation. Take New Urengoy: in the city's general plan, the population is planned "for an increase". And how could it be otherwise? Gas reserves provide the possibility for increasing fuel production plans. If a low city population is foreseen, then according to the quotas a service sphere will be created that can't meet the constantly growing demand. At first, I wanted to call this a small ruse, but there is a larger question: one of strategy, stemming from the existing forms of management.

[Answer] V.M. Igol'nikov: Conserving labor begins not with output, or operation, or the service sphere, but with construction. We have already mentioned more than once the block-set method. It makes it possible to do without a higher amount of scarce labor.

Build at a Fast Pace

[Question] "EKO": Do you think that the block-set method will make it possible to solve most construction problems?

[Answer] V.M. Igol'nikov: The limit to progress is only new progress. The tasks get more complicated, requiring new solutions. In connection with the shift to deeper strata, it is important to raise the efficiency of gas production and treatment methods. There are already plants in the world enabling production plans to be fulfilled without developing capacities or using additional manpower. The same is required of construction.

[Question] "EKO": How is construction activity evaluated in the largest gas-producing region?

[Answer] V.M. Igol'nikov: The plans for capital construction and gas transport for 1981, including not only Urengoy but also completion of the Medvezhe field's equipment, included over 200 million rubles' worth of construction-assembly work. The plan was fulfilled. Later capital construction plans have also been covered, with respect to the faster growth in gas production at Urengoy than planned and the intensive program of pipeline construction. Here is one characterization of the pace. Previously, 1-2 compressor plants went into production in the region each year; now, 4 must go on line, and up to 9 and even 12 in future years. However, predictions speak of colossal needs of the region for construction capacity according to our main administration, without counting construction of pipelines and Minenergo projects. At the growth rate required, not only field development, production and pipeline construction will be provided, but everything related to science and experimentation as well.

At this point, gas production is not labor-intensive. But already, more must be invested for future additional costs. Later, when the growth rates start to decline, the effect from the initial, large capital investments will be felt. Otherwise, future costs will exceed the optimum amounts. In other words, it is urgently necessary that a strong supply system be created today: construction organization capacity, centralized bases, and reserves for increasing production

capacity. Then, it won't be necessary to build more tomorrow. Unfortunately, supply systems are not always created.

[Question] "EKO": How should be capabilities of builders to provide for gas and condensate output be evaluated?

[Answer] V.M. Igol'nikov: Builders' potential depends first of all on the available resources, both human and material. Second, on the level of mechanization. Third, on the level of technological efficiency of work. Fourth, on the social-everyday and cultural services available to people. Take the level of mechanization. If the level of a good main administration such as Zapadstroy is taken as a unit, then ours is 1.8. We can see that this is not bad. But from the long-range perspective, we can't rest on such indices. We will need 5,000 more heavy vehicles, 2,000 units of heavy construction equipment. We hope we'll receive what we need. Minneftegazstroy does a good job of supplying us with equipment. In the last five years, we received 12 high-power machines; in 1982, 40. So there's not a problem with the supply rate. The situation is worse with servicing and repair, as has already been discussed.

[Question] "EKO": What sort of organizational problems with construction are there at Urengoy?

[Answer] V.M. Igol'nikov: Quite a few effective technological solutions have been created in our sector, besides the block-set construction. Just recently, a new proposal was considered for building structural foundations, resulting in a drop in the number of piles and an increase in their rigidity. But construction norms and specifications give us a good deal of trouble, as with the road builders and power engineers. Here's an example. It's advantageous to use metal in the North. In some cases, concrete is inadvisable, and prefabricated reinforced concrete has a low durability given sharp temperature fluctuations. But, it's useless to tell designers that metal piles are economical and durable. They continually explain to us that the construction norms and specifications prohibit the use of metal. Even though there is permission of Mingazprom and Minneftegazstroy to use metal in all bearing structures when building main pipelines and equipping fields!

Geologists have made a solid contribution to development of the construction base. In response to our requests, they have confirmed that there are clays, including claydite, in the Urengoy region. Claydite clays at gas fields are something one dreams of. A claydite heat-retaining jacket eliminates many problems. Wall enclosures, heat-retaining jackets of gas lines, efficient brick panels--all these could be manufactured here, locally. Excellent homes are made of vibration panels in European Russia, why shouldn't we have them here? Even the cement wouldn't have to be brought in to Urengoy.

We need to build plants for claydite gravel and pipe insulation. A light polymer insulation is needed: polystyrene foam, polyurethane foam. But so far we haven't been allocated polymers.

There's one other instance. New Urengoy naturally has a particular problem of null cycles; i.e., erection of foundations. An organization of Minnefteprom has created at Nal'chik a marvelous device for steam thawing of the soil. The builders need an initial 30 such devices, then another 5-6 per year. But, the problem hasn't yet been resolved at the level of several ministries.

[Answer] I.S. Nikonenko: Unfortunately, we weren't able to fulfil the construction plan in the last Five-Year Plan, basically due to a shortage of labor. This problem still continues. Another assembly ministry should be brought in. Let me emphasize that I am concerned that without the necessary volumes of construction, it is impossible to efficiently develop natural resources; negative consequences are possible. We have calculated the resources that should be put into developing the field in five years. If there are less, the disproportions have a negative impact on the field. It would be advisable to bring Minmontazhspestroy into this.

[Answer] V.M. Igol'nikov: Obviously, more should be built using one's own resources. For example, a trust with 40-50 million rubles' worth of construction and assembly work per year should be created for gas workers.

[Answer] G.I. Yepkhiyev: Of course, there should be a "northern" view of quotas used in construction planning. They should be examined considering our conditions.

[Answer] I.S. Nikonenko: I would say, not only quotas. Planning and design must be more long-range, stricter, better balanced. The sequence of project construction and their roles should be clearly defined.

People at Urengoy

[Answer] Ye.F. Kozlov: So far, we've been talking about production, management, science, technology and construction. But Urengoy is above all people. Interestingly, translated from Nenetsk, Nadym means happiness, while Urengoy means an upland overgrown with grass and reindeer moss. Nadym is already a major center, and Urengoy is being built up rapidly. Development of Bol'shoy Urengoy began quite recently, in 1978. The New Urengoy Party gorkom was formed in 1980. The city's population is already growing rapidly, rising by 1,500 persons a month. The total housing stock is 300,000 square meters. Construction of almost one million square meters is planned for the Five-Year Plan, making it possible to provide each resident of the city with housing space up to the national standards by 1985. Much is being done to create social amenities. By the end of the Five-Year Plan, construction should be completed of a city with all services for 90,000 residents.

[Answer] A.N. Silin: The interdepartmental territorial commission for Gosplan USSR has studied the plans for social development and the standard of living in the cities of the Tyumen oblast. Let me cite figures regarding the social aspects. It turns out that due to the high growth rates in the number of workers, New Urengoy is in a worse position relative to other cities of the oblast. The supply of housing space is 70% of the average level for an oil and gas complex, 50% of the norm. It's even less in other categories. The most radical means of overcoming this lag is to exert maximum effort to lower the number of workers. But a lag in social services is inadmissible in any case. This is evident, for example, from the experience of developing the Middle Ob region. Including the negative experience. An important means is refinement in the organization and management, overcoming departmental separation, where hundreds of enterprises of many ministries and departments can't find a common language, problems are solved inefficiently, and labor resources are not effectively utilized.

[Question] "EKO": The question naturally arises of how correct the fast growth in the North's population is? Aren't we enamored of big cities? It's hard to live here, the conditions are uncomfortable...

[Answer] Ye.F. Kozlov: I've already stated that the population of cities should correspond to the tasks of resource production. A city of 50-100,000 should be founded right away. The region's future is clear, and fears of exceeding the optimum population are unfounded. If less is planned, then the standards will not enable a satisfactory social and cultural infrastructure to be created for future growth.

[Question] "EKO": But a clear contradiction emerges. Everyone talks about managing with less, but a population with a reserve is put into the plans. The result is an unrestrained, unmanaged population growth...

[Answer] I.S. Nikonenko: Someone even proposed that New Urengoy be built for 300,000 people. In fact, much of the population might not be needed. But scientific research should help answer the question of optimum size. Each step to the North is a step on unthawed snow. Low temperatures, a harsh climate--these require highly skilled workers, who must be provided with the necessary amenities and comfort. I favor the version with a lower population.

[Question] "EKO": A city usually provides amenities and comfort. So, cities should be built after all?

[Answer] I.S. Nikonenko: Cities should be built, but the expedition-shift method should be carefully worked out. For an experiment in the beautiful city of Tyumen, it would be good to build two residences for field men coming here after their shift. With the shift method, 12,000 men would be required for the entire volume of production. For the person coming to the North to work at maximum output, he should be able to return to the "mainland". We sent a request to 40 cities to provide cooperative construction to those working in the North, say, 15 years. All the cities refused. Children must be considered; sanatorium schools should be created for them in coastal areas, where they would spend the year. We don't have a single Pioneer camp. Centralized ones could be created. We pay 150-200,000 rubles each per year to rent camps on the Black Sea coast, but the vacation facilities remain unsatisfactory.

[Answer] V.M. Igol'nikov: The union central committee could concentrate the resources we have already spent on Pioneer camps by the sea.

[Answer] I.S. Nikonenko: In our city, it's winter almost all year round. An open stadium is hardly suitable, so it's obvious that a covered one is needed, for some 10,000 spectators. But after four years of trying, we still haven't gotten permission to build it, nor a house of culture or club.

[Answer] Ye.F. Kozlov: If a kindergarten or school is built, it definitely should have a swimming pool, like they do in Noril'sk.

[Question] "EKO": So just what should cities in the North be like?

[Answer] V.M. Igol'nikov: New Urengoy should undoubtedly be built. But for how many inhabitants? There has to be a clear program, based on a forecast made with the assistance, for instance, of the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences in Novosibirsk. Taking Yamburg into consideration, of course. I believe doctors' assertions that a long stay in the North is harmful. But the shift method doesn't seem to be well enough thought out. I think people should only come here with their families. With the existing situation, there are interruptions in the work, production breakdowns and a drop in production rates due to the shortness of the shift (15 days). I think the system should be that a worker is here for 3 years; a director, 5-7 years. But they should live with their families, in comfortable conditions. They will be ensured housing "on the home front". Taking this into consideration, a city need hardly be built at Yamburg.

[Answer] Ye.F. Kozlov: New Urengoy is a young city--with a Komsomol pass, so to speak. An interesting moral and psychological climate has developed in it. We don't worry about stimulating people, for example, to do overtime work, but a good deal of thought should be given to providing services and cultural activities, so that the young residents of the city could spend their time profitably or celebrate a Komsomol wedding...

[Answer] A.A. Popov: In the militia, we feel that negative phenomena are caused to a considerable degree by poorly organized living conditions. Infractions of the law are most common in car-cities, where some of the people are still in temporary housing such as trailers. That's one thing. Another is the very high growth rates of the population. We aren't able to register them--there's only one passport worker.

[Answer] V.Ye. Degtyar': A good labor reserve for the region is student construction brigades, which have proven themselves well. But an obstacle to the adaptability of their members in the North is the same poor organization of living conditions. It would be a lot better if a prefabricated covered pool, gymnasium and libraries could be built for 2-3 months.

There's another problem. Only 40% of those in the student construction brigades have specialties and skills. Initially, they earn little. The approach taken in the brigade im. Nikolay Ostrovskiy is thus sensible: all its members worked first on the "mainland", where they received excellent training.

[Answer] V.M. Igol'nikov: The brigade im. 18th Komsomol Congress is also noteworthy in this regard. Of the 300 members, 52 have a higher and middle special education; 32 are construction engineers.

[Question] "EKO": One should undoubtedly keep in mind the conclusions of doctors that it is unadvisable to stay for a long period in the high latitudes of the North. From this come the expeditions, shifts, student construction brigades, and other temporary formations. But what about the skeleton around which a working, viable collective forms, the "nucleus" of the city?

[Answer] V.M. Igol'nikov: When I suggested that the term of stay in the North be limited to 3 or 5-7 years, I didn't mean that everyone would necessarily leave when that term expires. If someone wants to stay longer, and doctors allow it, then obstacles shouldn't be created. I'm certain there will be such people; they will form the skeleton.

[Answer] I.S. Nikonenko: Many arrivals want to study here. A technical school of the gas industry has already been created. But we also need an industrial institute. Better still, a complex of educational institutions, including vocational schools, technical schools and institutes. Many people leave because of lack of educational facilities for their children. A local educational base would help keep workers for more than one generation.

[Answer] Ye.F. Kozlov: Once again, the conversation suggests the conclusion that a scientific foundation is needed. What do all our comments about how many years should be spent in the North or how many people out of a hundred will stay here, without science?

[Question] "EKO": We have placed great hopes on the expedition-shift method. It has been analyzed in a number of studies. But one hears with increasing frequency that the method "doesn't work". Reasons cited are social and demographic barriers, and frequently an inability to organize projects well and realize them. But the method has taken root in the Tomsk oblast?

[Answer] Ye.F. Kozlov: The city of Strezhevoy can only be regarded as an experiment. The scale there isn't the same. A base city is needed for our region, since there aren't reliable means for delivery to the work site, to the shift.

[Answer] A.N. Silin: Organizational lack of coordination is discrediting the shift method: delivery of workers, creation of a base city and the shift complex--something always breaks down.

[Answer] Ye.F. Kozlov: The ministries could do a great deal. After all, there are trailers, cafeterias and baths for the North. But we have nothing other than experimental ones. And they don't hold up at minus 30°.

[Answer] A.N. Silin: Gas workers reject the shifts.

[Answer] Yu.T. Ivchenko: This merely emphasizes the organizational lack of coordination. A base, comfortable delivery to the work site and good services are needed. In and of itself, the method is good.

[Answer] Ye.F. Kozlov: I want to come back to the subject of the "Sever-1" units. No science has yet explained peoples' enthusiasm. And that is what motivates the crew of N.V. Minayev and others. They could have given up long ago, and a good project would have stopped. They tolerate a good deal in the way of wages, since, let's say, the members of a crew doing manual welding receive twice as much. The guys spend their free time promoting the "Sever" at the institute. They're fired up. And they're solving large-scale problems. Science must create an incentive mechanism that reinforces this enthusiasm. The seedlings of the future must be strengthened; favorable conditions have to be created for them.

[Answer] I.S. Nikonenko: It would be useful to create a sociological group, and let it study the scientific verification of stimulating high labor productivity and interest in the success of a common undertaking.

[Answer] Ye.F. Kozlov: We place great demands on science regarding labor, especially incentives and payment in the North. The preservation of differences in the size of regional coefficients for different personnel categories creates misunderstanding. This leads to personnel turnover. In Norilsk, it is 1.8 for everyone.

[Answer] G.I. Yepkhiyev: In science, it's the same. Only workers who have "settled down" have an incentive to stay. The others gradually switch to production.

[Answer] N.I. Dubina: It's difficult to train work collectives in the North without solving wage problems. The State Committee for Labor could have turned its attention to the North long ago.

[Answer] I.S. Nikonenko: The inflexibility in the wage organization is expressed notably in the following. We are going from the first unit to the ninth, farther to the North. The labor input changes, without a doubt, but the wage fund remains unchanged. In the winter, the temperatures are minus 50°-60°. You overspend 15,000 rubles to somehow improve the conditions, and you have to write volumes of explanations, and go report on it. Who needs this "economy"? A 60,000 ruble addition to the fund would yield millions and tens of millions in savings to the state.

[Question] "EKO": What steps can be undertaken locally to improve working conditions and its payment, without waiting for decisions of the appropriate departments?

[Answer] N.I. Dubina: Some things are being done already. In Nadym, for example, the method of combining professions is widely used. It encompasses 30% of the service personnel. The wage rises, plus there is a relative savings on it and the number of operating personnel declines.

[Answer] I.S. Nikonenko: Combination of professions, brigades--we use all these, but more fundamental, newer solutions are needed. How many "extra" people are there now in Nadym! The professions were redefined, but no one moved to Urengoy. There has to be a material interest in fulfilling plans using fewer workers.

[Question] "EKO": And just what are your own proposals and solutions?

[Answer] I.S. Nikonenko: We're for the "Urengoy" method. All its aspects are presently being worked out. We also invite science to participate in its verification. The essence of the method is simple: giving people an interest in working two to five times more productively. This requires payment according to the work performed. And if a person can do the work of three, or five, then let him get a higher wage. To some people in the southern regions, our wage level may seem excessively high. If so, then come and try it yourself! In brief, we're for profitable operation at the association level. The country allocates us certain resources, and we give it gas. For the gas to be cheaper, managers need to have independence at the local level, including the payment for labor.

[Conclusion] Integrated gas treatment plants go far into the northern Tyumen oblast, providing an irreplaceable contribution to the country's fuel and energy balance, to speeding up the economy's development rates and raising the well-being of the workers.

Creation of the large Northern Tyumen territorial production complex is raising a number of problems: economic, technical-technological, organizational, social. They are solved locally, by specialists who have gone through the school of developing gas at other regions of the USSR, including the North. The entire country is helping them. Yet at the same time, they are hoping to receive answers to many pressing questions from scientists, planners, designers, enterprise managers and sociologists.

They are worthy of the most attentive and responsive attitude.

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TURNOVER, ABSENTEEISM, ALCOHOLISM MANIFEST LABOR DISCIPLINE PROBLEMS

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 81-90

[Article by L. V. Markin, director of the Transport Machine Building Plant imeni V. I. Lenin (Barnaul): "A Full Measure of Responsibility for Discipline"]

[Text] Since the November (1982) Plenum of the CPSU Central Committee our plant's collective has felt a need to re-evaluate the work for strengthening labor discipline which has always been done in one way or another. A sharp statement of the problems related to state, planning, supply, technological and labor discipline is indeed a requirement of life, as they said at the Plenum of the Central Committee. And we are well aware of this at our enterprise. But before speaking about violators, as we sometimes familiarly call people who impede our work, let us look at what is being done so that a person does not become a violator, so that he does not want to be one. In other words, what is being done so that any worker at the enterprise feels concern for himself and works and lives under more favorable conditions. For it is difficult to require that a person take a serious attitude toward production if production, embodied in the administration of the enterprise, does not take a serious attitude toward him and does not solve the problems that bother him.

Social Attractiveness and Return

It seems to us that one of the first of these problems is housing. Under the 9th Five-Year Plan the plant spent 11 million rubles on housing construction, and under the 10th--17 million rubles. Approximately as much will be invested in plant housing under the current five-year plan. The majority of families live in modern apartments and youth live in well-constructed dormitories.

Almost all the shops have good personal facilities where one can take a shower and change clothes. We invest a good deal of money (7-8 million rubles a year) to acquire modern equipment which facilitates labor.

We are experiencing no difficulties with providing food for the workers: the number of seats in the 10 plant dining rooms makes it possible to eat quickly. Those who need dietetic food receive it. In shops that have 3 shifts hot food is available 24 hours a day. Questions of public catering are under constant control: a weekly conference with the director begins with these problems. And although the dining rooms are not legally under the jurisdiction of the plant, we handle all of their affairs.

There are quite a few women working at the enterprise and it is our desire to relieve them of some of their running around to the stores. In the dining rooms and cafeterias they sell semiprepared goods, there is a culinary store in operation and we are creating our own plant trade center. Our immediate task is to sell meat and meat products regularly at the plant. To this end we are developing a subsidiary farm which now has 280 head of large horned cattle of the hereford meat breed. These are large animals weighing up to 700-800 kilograms. Under the current five-year plan we intend to increase the herd to 800 head. But so far we are purchasing meat at cooperative trade prices and we use enterprise funds to make up the difference between these prices and state prices.

We have our own small refrigeration facility and we plan to construct another one that will hold 100 tons in order to have supplies of meat for public catering and the store for semiprepared goods that will last a month or two, and in the summer it is hard to conduct trade without refrigerated storage.

These efforts to improve the supply of meat products are appreciable and in this we are distinguished from many other enterprises. On the territory of the plant there are stands where one can order culinary items, cakes and other baked goods.

The medical service is also largely a plant concern: there is a polyclinic with modern equipment and a stationary hospital with 270 beds. Under the current five-year plan we intend to double its capacity.

It seems that the plant workers have many opportunities for all-around development and good recreation. They have a house of culture where there is even a national opera, a stadium and sports facilities, a swimming pool and a ski base, a preventive medicine facility, a house of fishing and hunting, and a suburban recreation base. If one also counts the Pioneer camp, the suburban children's dacha and the 12 kindergartens, we have a right to say that the social and domestic concerns of the enterprise extend also to parents and children.

Thus large amounts of money have been invested to create social attractions at the enterprise.

But still this attractiveness which we are achieving with such difficulty does not always produce the necessary return. There are many reasons for this, but let me begin with those that lie on the surface.

Demands Increase, Criteria Change

Every Friday I hold a reception to discuss personal problems. And 99 percent of the workers who come to this reception raise the problem of obtaining housing. I can understand young workers with families: he is in one dormitory and she is in another, and even with a child. Some of the young families do not have their own rooms or apartments. The problem of constructing buildings for small families and newlyweds in Barnaul is extremely crucial. We are hoping to build at least 2 buildings for young families. While during the past 10 years we have been tearing down the filled frame barracks left over from the war, the plant waiting list for housing did not change. In 1980-1981 we did not

designate anything to be torn down, and the waiting list began to decrease, but even now it has not disappeared. And we are receiving and distributing 100-150 apartments a year.

In the questionnaire those who leave frequently give the reason that there is a lack of prospect for obtaining housing, even though this is not always justified. Quite recently a family of 4 or 5 lived in a room of 15-18 square meters, and now these families live in 3-room apartments in which it is becoming "crowded" and one hears with increasing frequency that a 2-room apartment is too crowded for 4. Thus people's ideas and their demands change.

Some of the workers have a different attitude toward labor. In the city there is a great shortage of labor force. At our plant we have intensive labor and a high degree of responsibility for quality. Even though the light high-speed diesel engines that are produced by the enterprise are as good as many world models and are exported to 40 countries of the world, we certainly do not have such conditions in the shops as are to be found, for example, in an instrument building or radio plant. All restrictions on workers' changing from one enterprise to another were removed long ago. A person can choose where he wants to work and he frequently chooses it setting as his goal to make good wages without any special effort. For it is possible to have easy work and good money, and it is also possible to have difficult work and the same amount of money. Wages do not always correspond to labor, and this has painful social consequences.

A new occurrence has appeared which distresses us. This is arbitrary leave from production for an extended period of time when nobody knows what has happened to the person. He is gone for a month or two . . . the number of those "missing" increases especially sharply during the summer. We cannot release such a worker until we find him and find out where he is and what he is doing. Usually nothing special. It is just that during the summer season groups are formed who quit work. There are those who are not bothered by losing a month's wages, and they spend this month on the river. Still others quit work and spend the summer months digging in their gardens in the country, and then they sell what they have raised, having no concern for the plant.

It is possible to placate oneself by saying that there are not many people like this (although, how shall I put it: we fire almost everyone who is guilty of arbitrarily leaving production) and that these people do not determine the mood in the collective. But these people create a social "rust" which eats away at even a stable collective. Firing for arbitrary departure is not a sufficiently strict measure to be taken against people who have caused serious harm to the plant, the more so since they can easily find work at another enterprise. It is necessary to have measures that are more than administrative in nature, for example, a person who has left production arbitrarily should make up for the loss he has caused.

All these are relatively new phenomena which require analysis and interpretation.

During past years there has been an increase in labor turnover among engineering and technical personnel. We do not have enough engineer-technologists, engineers for processing metal, smelters, forge operators, thermal engineers

with higher education, or designers. Young specialists are sent to us through central offices from Moscow, Rostov, Riga, Bryansk, Sverdlovsk and Perm. Some of them do not wish to work and engage in clarifying their rights and complaining about the conditions for work and life. Their goal is not to work the necessary 3 years, but to return home. Thus of the 13 young engineers from Bryansk who graduated in 1980 only 3 remained at the plant and the rest went back.

Specialists from the European part of the country do not settle down well in Altay Kray. We need local personnel who are trained at the Altay polytechnical and Siberian metallurgical institutes. We need young people who have their roots here, their parents and their relatives. The plant sends everyone who wishes to go to VUZ's and tekhnikums and agrees to have its stipend recipient in Siberian training institutions. But so far this is not enough. It is necessary to increase the training of specialists and skilled workers from the local population.

The Effect in Each Unit

"The truant, the slipshod worker and the idler cause harm not so much to themselves as to the collective, the society as a whole," said Yu. V. Andropov at a meeting with Moscow machine tool builders.

Indeed, plant economists tell me that labor productivity (and ours is fairly high from the standpoint of the branch) can be increased by 30 percent if labor and living discipline are increased. Among the violations, drunkenness is number one.

In the past we failed to notice people who drank because there was a shortage of workers and the level of mechanization of labor was lower. Now at the plant 44 percent of the workers operate more than 1 machine tool and service from 3 to 8 metal cutting instruments. Previously 1 machine tool stood idle because of a drunken operator, while now an entire line can be inoperative. Moreover, the proportion of calculated technical norms has reached 93 percent, that is, the cost of a working day has increased, there are no workers with a reserve of time, and they cannot do the work of their neighbor who is absent.

The plant is praised for its active struggle against drunkenness. About 6 percent of the workers are on the list in the plant narcological office. And there are so many of them who "simply got drunk and did not come to work." The plant narcological commission is operating actively and we are applying the methods available to us for working with alcoholics, but this work is not effective enough. In order to solve this problem, in my opinion, we need decisive measures of a statewide nature.

I can say without exaggeration that our plant is among those enterprises that take the maximum number of measures to fight for order in production. Our system of punishments for violators of discipline works efficiently. The shop chiefs at the beginning of each day know who has been absent, who has been late and who has been detained because of being drunk. This information is available at 9:30 a.m., and many shop chiefs use it for the appropriate actions. But in many cases the managers must depend on the violators since there is nobody to replace them.

The dependency of the managers on their subordinates begins when they are hired. The so-called labor agreement is extremely conventional. A person submits an application for work and on the next day he can apply to be released or simply leave of his own accord. Those who are hired make no commitments, they have only rights. And yet there should be equality for the "higher parties to the agreement." Specialists in labor law say nothing; they apparently think that everything is in order. We donot think so.

But what can we do about a slipshod worker? With his agreement, if he admits his guilt, we can deduct from his wages the cost of the materials that have been damaged, if he does not agree, the administration must go to court. Formally all this is correct, but it is difficult to punish a slipshod worker. In practice the plant is capable of making the worker compensate for only part of the losses from his poor work. Perhaps there are plants where the compensation is greater?

Labor discipline depends largely on the organization of material and technical supply. Certain shops lose days because of a shortage of metal, the workers are given days off or they work in construction, and then they arrive and they are told: "You have to work on Saturday and maybe on Sunday."

And it sometimes happens that the prepared product remains at the plant. Somehow we have accumulated 4 million rubles' worth of perpared products. We had nothing in which to pack them because the Kuzbass territorial administration of the USSR Gosstab took away the plant's funds for timber materials. Where did they go in the middle of the year? It turns out that the Gosstab workers decided to give us round timber and announced: "Construct your own sawmill." And what do you think? We are constructing it! But what about tomorrow? Will we have to fell trees? . . .

"Do everything for yourselves"--this approach is openly publicized. We tried to dress the masters in a special uniform, at least to give them this if we cannot give them higher wages. We looked for 2 years for someone who could sew them. Somehow we managed to get this done on a one-time basis. But special clothing wears out. What will happen then? "Sew them yourselves!" . . .

This is why we completely support the words of Yu. V. Andropov at that same meeting with the Moscow machine tool workers: "We are speaking about a serious attitude toward all aspects of production discipline, including technological and supply discipline and so forth. It is necessary for the effect from increased discipline to be manifest in all units of our production."

Several Suggestions

What must be done in order to increase labor discipline, efficiency and the quality of organization?

First, we should like to have in the system of wages more appreciable incentives for continuous work at one enterprise. It has turned out that the difference between a person who works conscientiously for a long time and the one who runs from one place to another have been reduced to a minimum. Before going on pension the fly-by-night gets a job working in a smelting shop,

earns good wages, and receives the same pension as an honored veteran. It is necessary to guarantee larger pensions for veterans of the enterprise, and before that they should receive higher wages, additional vacation, free passes for therapy or recreation, and the right to receive dwelling space first, that is, a complex of measures that stimulate work in one enterprise, beginning with the first year of work. I would encourage the head of the labor dynasty to bring each new member of his family to his home plant. The more family workers that work at an enterprise, the more the father receives. But just try to give incentives with such a policy! . . .

And, conversely, a person who leaves an enterprise should feel that he is really losing something by interrupting his length of service.

Second, it is necessary to increase the responsibility of each worker for violation of labor discipline. Perhaps one should establish a scale for reduced paid vacation depending on the number of absences. If during the course of the year the loss of working days is equal to or exceeds the number of vacation days, the vacation is not granted at all. We still have not managed to meet this Leninist requirement whereby absences are compensated for in nonworking hours or on holidays. What is keeping us from introducing reimbursement, if only partial, for the damage caused by absences?

The spring departure of illicit vacationers can be stopped in only one way--to prohibit payment according to agreements which involves increased payment for work that is done with materials and mechanisms belonging to the state. Only this will be effective for those who like to interrupt their work for more than a month.

Third, it is time to deal decisively with a whole number of problems regarding wages, which should stimulate increased qualifications and correspond to labor expenditures. On an average, the work of engineering and technical personnel is actually valued at a lower rate than that of the ordinary laborer. Unskilled workers can obtain more than engineers do. I think that this is unfair. Wages are a complicated problem, but how much trouble can be eliminated by solving it? At our plant we have many capable and intelligent designers, technologists and engineers who should be given much greater wages, but we cannot grant them because we are strictly limited by the schedule of salaries.

A person should be motivated to earn his money. An ace lathe operator has a salary in the 6th category plus a 40 percent bonus, and that is all. As a rule, these specialists are on the time-rate-plus-bonus system of payment. Such shops as the instrument, repair-mechanics, electrical repair, precision mechanics and experimental shops all have new work for which it is difficult to set norms. Highly skilled workers with "golden hands" work in these places. It is necessary to train for 5 years in order to replace the departing veterans. But the prestige of a number of complicated occupations has dropped. On the flowline they learn to start, stop, insert and remove very quickly--and their wages are the same as those of veterans in auxiliary shops! It is not only the volume of labor that is important, but also its complexity and quality. We are experiencing increasing difficulties with workers who are able to make stamps, "catch" microns, and turn difficult profiles on lathes . . .

Several of the problems I have mentioned require solutions on a statewide level. But some of them can be successfully resolved in our own region, through the efforts of our own enterprises. In this respect the advice of directors could be very useful. It seems to us that there are both regional and branch councils of directors which extremely effectively combine the interests of groups of enterprises. Unfortunately, we do not have these. We have asked the city authorities to permit us to discuss thoroughly certain problems that bother everyone, for instance, housing construction, the plans for which regularly fail to be met. We could combine our efforts, create additional capacities to help the construction workers and find certain reserves. Naturally greater participation in construction and the introduction of dwelling space also presupposes a more active role on the part of the council of directors in distributing this dwelling space among interested parties. And there are a number of problems that require very thoughtful and careful discussion among involved managers. In fact almost all social problems are like this. I would call them problems of the social well-being of the collective. Production now depends to an ever more decisive degree on profound understanding and a comprehensive solution to them. Unfortunately, the abundance of limiting instructions and directives develop among enterprise managers a certain style of behavior, extreme caution with regard to any innovations: for only after their completion does it become obvious that they have been advantageous, that punishment should not be given for this initiative, that the manager has not been pursuing his own selfish interests.

The responsibility and rights of a director should go together. So far this is not always the case.

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CSO: 1820/129

ROLE OF MANAGEMENT CONSULTANTS AT AKTYUBINSK X-RAY EQUIPMENT PRODUCTION
ASSOCIATION EXAMINED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in
Russian No 5, May 83 (signed to press 11 April 1983) pp 91-110

/Round-table discussion conducted by V. D. Rechin, candidate of economic
sciences, material prepared by Ye. Lysaya: "Aktyubrentgen: Three Years
After Consultation"/

/Text/ In the 8th issue of the magazine for 1980 a selection of materials
was published in the magazine, "The Plant--Through the Eyes of Consultants,"
which was devoted to an investigation of the Aktyubinsk x-ray equipment plant
by a brigade of EKO experts.

The editorial mail in response to this publication and other articles in the
magazine on problems of consultation activity again showed the degree to which
there is a need to organize administrative consultation. We receive many
letters requesting that a brigade of experts be sent to investigate and
help . . .

Understandably, the editorial staff cannot fulfill the functions of a consul-
tative organization. And we have not set this task. The work of the editorial
staff at Aktyubrentgen plant was intended to provide a concrete example of
possible ways of improving the administration and organization of production
and drawing attention to problems of consultation activity.

Three years have passed. Many changes have taken place at Aktyubrentgen. In
1981 a production association was created on the basis of the plant and the
special design bureau for x-ray equipment. By the beginning of the 11th Five-
Year Plan the volume of products produced had doubled as compared to 1976.
How are the recommendations of the consultation brigade being realized, what is
the point of view of the specialists of the association regarding problems of
the development of administration consultation? Read about this in the selected
materials below.

"Cooperation with experts is useful and fruitful," assert managers and special-
ists of the Aktyubrentgen association.

(EKO round table)

Participating in the meeting were:

- B. S. Akimov, deputy general director for economics;
- V. M. Gavrilov, head engineer of the special design bureau;
- V. A. Morozova, chief of the division for organization of labor and wages;
- P. B. Paradovskiy, leader of the assembly shop brigade;
- S. T. Pachin, deputy general director for production;
- V. A. Petrushanskiy, chief of the division for automated control systems;
- A. I. Seraliyev, head engineer;
- D. M. Sultanov, secretary of the party committee;
- V. F. Trigub, head technologist;
- M. I. Khvan, deputy head engineer;
- I. P. Shkurenko, general director of the association.

The round-table meeting was conducted by a member of the editorial board of the magazine EKO, V. D. Rechin, candidate of economic sciences.

EKO: We should like to know how the recommendations of the consultants are being implemented and what they have produced for the association. Three years is quite enough time to determine how viable the innovations are. Time has conducted a certain test. It has made it possible to single out what is important and seminal from what is secondary and inessential.

Let us recall briefly the content of the recommendations made by the EKO brigade.

The consultants suggested revising methods of control of scientific and technical progress at the plant. They said that the strategy for developing new items was incorrect.

The brigade advised accelerating the creation of an automated control system for the enterprise and suggested the sigma ASU as being the most suitable.

The experts drew attention to the poor work on long-range issues in the plans for socio-economic development. In particular, they agreed, under the leadership of the consultants, to conduct an experiment for arranging individual career plans for the workers.

The consultants investigated the organization of intraproduction autonomous financing and expressed dissatisfaction with its condition. They made a suggestion about the direction for improving the economic mechanism for administration of the enterprise.

The group of recommendations was directed toward improving the organizational structure.

The Strategy for Development was Refined

I. P. Shkurenko: A deep impression was made by the opinion of the consultants that we have very uninspiring paths for the development of production--all of them are related to increasing the volumes, and there is no banner that would be raised if the collective achieved a common large goal. Now such a goal has been set--the assimilation of Rentgen-1001 medical equipment and the creation on the basis of this of a range of principally new items on a world level whose analogues are produced only by 2 leading foreign x-ray equipment firms.

A. I. Seraliyev: Unfortunately, the realization of this intention is being delayed because of the same factors that were discussed last time. The special design bureau for x-ray equipment construction is loaded with orders for new developments that are twice as great as its capacities. We cannot reject them even though we do not consider all orders to be expedient. Because of the endless haste, it is difficult to concentrate on one thing and deal with it in detail. Hastiness also influences the organization of the assimilation of new items in production: we are not keeping up with technical preparation. All this distracts us from our work on principally new items. But the idea expressed by the consultation brigade is living and assuming real features.

V. M. Gavrilov: For example, they would not sign our plans until we included a "small-scale portable x-ray machine with a transformer." Why this? They have been making these abroad for a long time. But it was included in the instructions . . .

V. F. Trigub: Since 1954 after completing the institute I have been working at the plant and as far as I recall we have always struggled to meet the plan and there has never been any purposive struggle for technical progress. One of the plant's problems has been that we have not been able to determine the products which would bring it up to a leading level. We have now made such an attempt. The recommendations of the consultants gave us a nudge. It is necessary to feed this fire and fan it into a brilliant flame.

A. I. Seraliyev: While a sufficient reserve of ideas and decisions has been created in the area of administration, there is none in the strategy for developing new items. The technical preparation of production also lags behind the demands that are placed on it. Work in the sphere of improvement of organization and administration of production and labor outstrips the rates of work on new technical equipment and technology. We hope that the technical program that has now been created for the period up to 1990 will eliminate this disproportion.

I. P. Shkurenko: Yes, the program should give purpose to this work. In order to improve the technical preparation for production, we are introducing an automated system, the first section of which has already gone into operation, we are taking measures to mechanize and automate production on the basis of robot equipment, and we are expanding the section of machine tools with numerical

program control. The discussion with the brigade of experts in development strategy played a large role for me as the manager. If we had held on to our old ideas the plan for future developments and the plan for technical re-equipment would have been different.

EKO: At the November (1982) Plenum of the CPSU Central Committee it was emphasized that reserves for development of the national economy "must be sought in the acceleration of scientific and technical progress and extensive and rapid introduction into production of the achievements of science and technology and advanced experience." Therefore it seems to us that the refinement of the strategy and the prospects for development that has been undertaken by the association is a very important step.

The Personnel Problem Has Become Worse

V. A. Morozova: Much depends on personnel, and the association's difficulties with engineering personnel has even increased during these years. Therefore we are doing a good deal and wish to do a good deal, but we do not always have the personnel capabilities.

V. F. Trigub: We do a poor job of training management personnel. First of all it is necessary to draw attention to this problem.

V. M. Gavrilov: It would be more precise to say that we are not very capable of teaching personnel in all units, beginning with the workers and ending with specialists and managers.

S. T. Pachin: We do not certify engineering and technical personnel with the exception of masters. I consider this to be a large shortcoming in the association's personnel policy.

A. I. Seraliyev: Because of the daily trivia we have not had opportunities to analyze and find out whether our specialists are actually handling engineering matters and what part of their time is devoted to these, and what part of the time is taken by routine work. A sociological investigation on the subject "The Engineer and His Creativity" could produce a great deal.

V. A. Morozova: We have a club for business meetings which we call PPR--"We have spoken and spoken and dispersed" (orders and instructions are not issued on the basis of the discussions in the business club, but the conversations leave an undoubted impression: new ideas and collective decisions appear). So one time we were talking about why specialists leave us. The association enjoys authority in the city and it regularly fulfills the plan. Our working conditions are better than at other enterprises and earnings are higher, but people still leave. Why? One of the answers (in my opinion, fairly reasonable and confirmed by facts) was this: "They go to take command positions." Consequently, our situation leaves something to be desired with respect to the advancement of engineering and technical personnel.

S. T. Pachin: A couple of days ago I conducted a council of masters of the association and statistics were given there from which it is clear that still more people come to us than leave.

EKO: It is good that you follow the movement of the master personnel. This analysis is necessary for all specialities. Recently at enterprises and in associations the role and responsibility of the personnel service have increased. In order to control the process of movement of personnel, production managers are striving to have permanent and reliable information, and they are requiring it from the personnel service. The service itself, on the basis of its information, conducts an analysis of labor turnover and violations of labor discipline, and draws the attention of the managers to these questions. In the magazine we discussed the experience in work with personnel at the Magnitogorsk metallurgical combine and other enterprises. Apparently this problem has become more critical for you too, and it requires new forms and a higher level of organization.

I. P. Shkurenko: The personnel problem has become more critical in the association, in my opinion, because of two factors: because of the higher level of technical tasks which we have begun to carry out under the 11th Five-Year Plan and because of the fact that industry in the city is developing rapidly and the demand for specialists has increased sharply. The high authority of our specialists provides them with an opportunity of transferring to other organizations in considerably higher positions. Incidentally, in work with personnel we have placed great hopes in career plans. With their help we would like to determine the prospects for advancement of each specialist into positions, wages, the solution of social and domestic problems and so forth. It is a pity that this has not happened. Apparently we have not been persistent enough and the consultant has become indifferent to the subject, or, more precisely, to the results of research on it at our plant, since, as we know, he is continuing on this subject. It would be directly useful for both parties to return to this problem.

Experts And Plant Specialists: Principles of Cooperation

EKO: A number of the recommendations of the consultants were related to the organization of the operation of the computer center and the selection of directions for the development of the automated control system. A system was proposed which has proved itself well at enterprises with a similar type of production--series and small series: the Sigma ASU. How far have you managed to get in solving these problems?

V. A. Petrushanskiy: A considerable amount of consultative assistance was rendered on problems of the ASU, although it should have been more concrete. Conversations with doctor of sciences N. B. Mironosetskiy were very useful as were his lectures for our plant's specialists on problems of development of automated control systems, and joint trips to enterprises of Altay Kray where Sigma ASU's are functioning. All this undoubtedly played a role in the understanding of the tasks of the ASU, which, before the meeting with the consultants, people at the plant regarded as something abstract and, if you wish, useless. The consultations with the scientists gave the specialists of the computer center confidence and courage. First we understood that we cannot

be simply clients who expect and receive just any solutions from the developers, but we also must be co-workers. And then it was decided to take on some of the functions of the developers. We are speaking about the complex "production" for procurement shops which we constructed on the basis of our existing principles of continuous operational planning following the experience of the Novocherkassk electric locomotive construction plant and the card catalog for proportionality. We revised the organizational structure of the computer center, taking into account the experience of Sigma users and the recommendations of scientists.

I cannot say that we received no assistance from the ASU of the Novosibirsk NIISystem which was recommended by the brigade for finishing. The institute determined and ordered the entire complex of equipment necessary for the functioning of the ASU, and organized the training of programmers, of which we were experiencing a critical shortage. But the practical assistance in adapting the Sigma to our conditions was, in our opinion, inadequate.

It seems to me that the problem of completing the development up to industrial introduction is fairly typical of the cooperation between science and production. I am convinced both from my own experience and from the experience of other enterprises that only when computer centers or ASU divisions of the enterprises take the responsibility for completing the system up to industrial operation into their own hands, only then will the system begin to function advantageously for production. In this I agree with the article by Yu. I. Tychkov, "The Manager and the ASU," which was published in EKO No 5 for 1978.

EKO: Vladimir Arkad'yevich, last time you wrote in the magazine that you were attracted by the principle of interaction of members of the association of the Sigma ASU: every user enters it not with empty hands, but with something of its own, new decisions which he discovers when adapting the system to production. You thought that your contribution to the development of Sigma would be the complex "Wages" on the basis of brigade organization and payment for labor according to the method of the Volga Automotive Plant. To what extent have you managed to realize this intention?

V. A. Petrushanskiy: I still think that the principle of cooperation of members of the Sigma association is progressive. Because of it we were able to take advantage of the assistance of several Altay enterprises that are Sigma users. But we have not managed to realize this intention, primarily because we did not begin the automation of the control of procurement production on the basis of Sigma. In the assembly shops we are trying to utilize Sigma principles. As for wages, we have decided to postpone this task for the time being since otherwise we would not have enough machine time: for in addition to the enterprise ASU, we are also developing an automated system for technical preparation for production, and the capacities of the association's computer center are not very great. Our machine calculation station is still quite capable of handling wages.

S. T. Pachin: But still I would reproach the consultative brigade for the fact that it did not include assistance for developing the ASU.

V. F. Trigub: You, Saveliy Timofeyevich, said before that the task of consultants is to investigate, to encourage and to suggest . . .

S. T. Pachin: To encourage, suggest, inform and give recommendations--the brigade fulfilled these functions successfully. This is an entire program of action, right down to training in a special department at the Novosibirsk institute. But in individual cases, particularly when creating an ASU, practical assistance is necessary. Since the EKO brigade is some kind of model of a consultation organization, I would like to make the following suggestions: in addition to consultation firms that do general diagnostic investigation of enterprises and are capable of determining strategy, there should be small specialized organizations that are competent to resolve concrete administrative problems.

EKO: During the period of the work of the brigade of experts you were very distressed by the condition of the organizational structure. What is the situation now?

V. A. Morozova: This area of consulting, in my opinion, has ended up to be the most realized. At that time we introduced a base system, and the structure of the shops, centralization of supply and service for production were given first place. We fluctuated: to take all services from the shops or to leave some, and which ones precisely? The shop chiefs were against the reorganization and tried to insist on at least some functional and service subdivisions. The consultants were convinced that if they were to be centralized they should be fully centralized, including production support. They suggested a successful organizational solution: to create a shop for transport and warehouse service which would provide for production right down to delivering parts and blanks to the working positions. Previously each shop chief and master handled supply and batching items. There was general confusion because everybody was looking for something . . . now we have put an end to the muddle.

P. B. Paradovskiy: I would not put it so categorically: there has actually been more order, but the problem of batching has not been fully resolved, especially in the assembly shops. True, we are speaking not so much about parts delivered from related shops as about purchased items. In the end a part, even if it is too late for the assembly, can always be acquired, and if it is a simple one we can make it ourselves. The brigade form of labor organization has forced the labor collectives to take more responsibility for the fulfillment of the assignment. Mutual assistance, mutual advantage and the struggle against idle time have given rise to a desire to master related specialties, to perform related jobs, if necessary, and to increase skills. But if we are short a transistor or a resistor we cannot make them ourselves, and we go to the central batching warehouse if it is not delivered promptly to the working position. Most frequently interruptions are not the fault of the warehouse, but because of difficulties in material and technical supply.

M. I. Khvan: All auxiliary and service shops are centralized at the level of two productions--x-ray construction and consumer goods. Their functions are fairly clearly defined, but because of interruptions in deliveries the repair schedules are still violated. Thus here shortcomings in material and technical supply reduce the effect of the new organizational structure.

EKO: And what has changed in the economic mechanism of administration during this period? Without disputing the conclusions of the brigade concerning shortcomings in the organization of intraproduction autonomous financing, you at that time did not agree with the methods of evaluating its level. Incidentally, the readers of the magazine rated fairly highly the article by B. Ya. Zheleznyak regarding autonomous financing. The editorial staff received many inquiries about the methods and requests to investigate the level of autonomous financing of administration. We know that you now have a somewhat different evaluation of the recommendations of the experts. What has changed in the mechanism of autonomous financing of administration? What have you managed to realize from the ideas discussed in the last article by the deputy director of Aktyubrentgen for economics, B. S. Akimov?

B. S. Akimov: Yes, we really did change our attitude toward the recommendations and even used the proposed method to analyze the level of organization of autonomous financing work. But still, the consultant made suggestions not about what to do but about what should be. That is, he considered the situation from general positions.

But the problem remained crucial. We did not revise the organization of autonomous financing in the shops, but to some degree penetrated into the organization of brigade autonomous financing, although we did not follow this to the end. The production volume, the output of products in physical terms and labor productivity are planned for the brigades. So far we are not succeeding in planning the wage fund: the formula used to determine the earnings of the brigade turned out to be imprecise. Now, with the help of the Kazakh Polytechnical Institute we are improving the methods for calculating wages for production brigades.

In connection with the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 much that is new has appeared in the methods of economic administration. Autonomous financing should be based on different indicators. And we cannot inform the shops of them since the normative net output (NChP), in our view, has not been a precise enough means of measurement. In the first place, the proportion of profit in the NChP is so great that real labor expenditures are hidden, and, in the second place, the percentage of the NChP in the composition of the wholesale price is incommensurate for various items. For us it ranges from 23 to 60-70 percent. Moreover, it is necessary to introduce double accounting: both in terms of points and in terms of the NChP. Because of this the economic service is overloaded with routine accounting work.

EKO: Nobody imagined the matter in this way: the consultation firm comes, it throws out a mass of ideas and the plant workers immediately set to implementing them. It is understandable that if something new contradicts the existing ideas it will be disputed and can be refuted at first. This stage with respect to methods of autonomous financing administration has passed. One cannot agree with the idea that the practical assistance was inadequate. But still we cannot see that attempts were made to find other ways of improving autonomous financing.

I should like to conclude the discussion on principles of cooperation with two conclusions. One has been suggested by you: consultation firms that resolve general problems of the enterprises that are investigated should have organization co-workers who specialize in the development of concrete plans for administration. The firm can hire them at the request of the client or at their own discretion in order to carry out the recommendations it has made.

The second conclusion: a good deal depends on the position of the client: the clarity of his idea of himself and what he wishes to obtain as a result of the consultation determine how actively he implements the recommendations.

There Are No Eternal Problems

EKO: Do you think that the association still needs consultation and what questions would you now raise for the experts?

V. F. Trigub: The need for consultation is obvious. We have been forced to tear ourselves away from current trivia and look into the future and analyze our problems. And although no specific recommendations pertain to the technological service, it is important for it to take the approach to problems of scientific and technical progress, which is gradually taking place in the association because of the consultants.

I myself am very interested in another meeting: problems have arisen which did not exist last time. I have tried to find answers to them in the literature on administration, including in the magazine EKO, but I could not. I am interested in how best to organize the interaction between technologists and the designers who develop a new item. We all understand that the connection between them is best established in an early stage--this will subsequently reduce the technical preparation of the product for production. The earlier the cooperation between the two services begins, the more influence the technologist can exert on the technological qualities of the item and on the level of organization of its production. But we do not know how to solve the problem in practice. The second question is how to organize the work in technical divisions most efficiently, for example, on the basis of special-purpose programs? .

Of the general problems of administration of the association I am bothered by this one: we have ties among subdivisions and we have become bureaucratic, and because of this we have lost a sense of responsibility to a certain degree . . .

EKO: Strongly stated. But can you be more precise about where this is manifested?

V. F. Trigub: The greater the number of people who participate in making a decision, the less each feels his own responsibility; they all place their hopes in one another. The logic is as follows: "I will sign the paper, but let him do it." That is, if three workers have signed, the matter suffers. But if the responsibility belongs to one person, then he brings in everyone who is needed and carries out that which is entrusted to him. And here I am saying that with

dual jurisdiction--administrative and functional--we have become bureaucratic to some degree and lost our sense of responsibility. Fortunately, this pertains to administrative and technical services, and not directly to production.

A. I. Seraliyev: Yes, the services have branched out a great deal and the functional duties are not clearly distributed. There is an active "football game" going on.

B. S. Akimov: I do not entirely agree with Vladimir Fedorovich Trigub. We have simply become more demanding of ourselves and therefore we see more shortcomings. And, finally, it is impossible to have a cardinal solution to all problems in 3 years. Some things appear worse today and some things appear better.

The association did not have stable planning indicators for the 11th Five-Year Plan even in the middle of 1982. Under these conditions it is difficult to determine which issues are primary. But it is quite obvious that it is necessary to improve control of material resources and to change the accounting for commodity and material values over to the ASU. Ties have in fact become more complicated, and we will not be able to do without an automated control system in the sphere of material and technical supply. We are very interested in consulting on these issues.

S. T. Pachin: Indeed, much depends on the insufficiently clear-cut planning and is reflected in all internal units, beginning with the brigade.

D. M. Sultanov: I am bothered by questions of responsibility of shop chiefs for educational work. In the new structure we have relieved them of many of the functions and concerns that are not properly those of the shop manager, but so far we have not received the necessary return in the education of the labor collective.

V. M. Gavrilov: In introducing the VAZ system, we conducted a large amount of reorganization of the subdivisions. Now some of them are under dual jurisdiction. This is a new phenomenon for us, one which is complicated and not completely assimilated. It would be good if the specialists in organizational structures were to take a look at the association after the restructuring of administration.

EKO: The system of this jurisdiction or the matrix structure of administration exists at KamAZ, Uralelektrotyazhmash and several other associations in addition to the VAZ. At one time our magazine published an article by professor B. Z. Mil'ner on this subject and a selection of materials about the experience of these associations. It would apparently be worthwhile for your specialists to visit one of them.

I. P. Shkurenko: But one cannot close one's eyes to the negative influence of external factors: delay in establishing the plans, the imposition of orders for new technical equipment which has been discussed here, interruptions in material and technical supply . . .

B. S. Akimov: We have a new association. We have still not developed procedures for interrelations among subdivisions and services. We are very much in need of consultation on procedures for document turnover and clerical work.

D. M. Sultanov: One cannot forget that the high growth rates of the volumes of production also leave their mark. We are introducing new shops and fairly actively assimilating capacities. The production volume doubled during the 10th Five-Year Plan. Even in 1980 when there was no startup of new capacities we produced a 60 percent increase in commercial output, mainly as a result of increased labor productivity. And this was when during the last year of the five-year plan there was a large amount of work for reorganization of administration on the basis of the VAZ methods. Many enterprises insist on adjusting the plan during these periods. But we not only did not ask for this, but continually increased production volumes.

Still one cannot deny that we have lost ground with respect to social issues. I am speaking about conveniences in shops and working conditions. To a certain degree we have been affected by the fact that in recent years we have been given many new tasks in the area of construction: the creation of a subsidiary farm and the erection of residential buildings using internal forces.

V. M. Gavrilov: I am not sure that all these problems that are facing the association need to be discussed with experts--for example the work of the construction subdivisions or purely technical tasks. These are more our internal affairs. But in organizational problems--for example, how design and technological services should interact in order to accelerate the construction of new technical equipment--the help of consultants can be extremely appreciable. We have been working on this for a long time and cannot cope with it ourselves. Therefore I would be in favor of periodic investigation of the association by competent experts.

S. T. Pachin: Today we have discussed practical assistance and the degree of its concreteness. I agree with our leader, that a good deal depends on the position of the subdivision and its manager if this is a question of one subdivision; and on the position of the director if we are speaking about the enterprise as a whole. Remember how last time the management gave a hostile reception to the evaluation of our systems of labor stimulation, especially the system for control of the quality of labor and product. This opinion was also shared among specialists. Time showed that the consultant was right and his suggestion to change the system of evaluation and stimulation of the labor of engineering and technical personnel completely coincides with our point of view . . .

I am in favor of conducting consultations because, along with solving purely practical problems, this is also communication and enrichment with new ideas and information about administration, and it also means the opportunity to see production through the eyes of competent specialists.

M. I. Khvan: And another subject for experts: how to improve the level of auxiliary production? How to re-equip the consumer goods industry?

EKO: And still many of these problems sound like the old ones. Does it not turn out that 3 years pass and they again repeat themselves?

V. M. Gavrilov: In various stages of production one and the same problem sounds and is raised in different ways.

V. A. Morozova: Are problems of personnel training and social problems not really eternal ones?

EKO: If one speaks about specific tasks, they are not eternal although, actually, there are general problems which will always occupy the managers. And then one frequently uses the expression "to introduce order." And this is clearly infinite . . .

S. T. Pachin: Because of the consultation brigade and training in the special department for management personnel at the Novosibirsk State University imeni Leninskiy Komsomol,* our specialists have developed a greater interest in analysis of production situations. I had occasion to be among the first three Aktyubinsk workers who took the course in the special department. Even before this training I was interested in problems of administration. But now I perceive many things in a different way and have opened my eyes to many things.

Just take the accounting and supply for production through the shop for transport and warehouse service. It has undoubtedly improved. But now we place different requirements on it, from the standpoint of a higher level of organization. A second example. Three years ago there was no special material and technical support for repair brigades. Today it exists, but our needs today are no longer satisfied.

D. M. Sultanov: Yes, Saveliy Timofeyevich is right. For example, previously methods of planning the work of the brigades were extremely coarse and approximate. With the help of electronic computers they have become more refined and more precise. Naturally, those aspects which were previously unnoticed are now being discovered.

I. P. Shkurenko: We are continuing to work on the majority of issues that were discussed last time and therefore we are more pointed about them. But one can not deny that we are still skipping over certain problems--both in the area of economics and in the technical sphere.

EKO: Thank you very much for these interesting statements which were filled with content. The fact that the critical approach prevailed in them shows both your dissatisfaction with individual aspects of the activity of the association and your desire to improve them. The striving for the new in the association is extremely appreciable, and this gives rise to search and, in the final analysis, leads to good results of production activity.

I should like to express these wishes. First of all, that the program for technical development and the creation of promising new items enters the stage of practical realization more rapidly.

*"The Department Doors Are Open," EKO, 1979, No 6.

I should like to see more energetic actions in improving intraproduction autonomous financing as well. It is not necessary to insist on those suggestions made by the consultant if they do not suit the plant, but one can advise turning to the experience of the leading enterprises of the country. Of course, the first one is the VAZ, since you are introducing the VAZ comprehensive system of administration. Specialists of the Volga Automotive Plant advise those who take advantage of their experience to introduce it comprehensively. Autonomous financing methods of administration are an indispensable part of the VAZ comprehensive system of administration and organization of production and labor.

One can also recommend investigating the experiences of enterprises of the Ministry of the Electrical Equipment Industry, which are developing and applying normative methods of planning and accounting for expenditures on production. In particular, the experience of the Elektroagregat production association (Novosibirsk) is discussed in the first issue of our magazine for 1983 by the deputy general director for economics, I. S. Stepanov.

The discussion has shown that at Aktyubrentgen problems of the personnel policy are more crucial now than they were in the stage of consulting. Perhaps a special-purpose program is needed here, with preliminary investigation and analysis of the existing situation. At your request, the EKO brigade helped to send to Aktyubinsk a sociologist who is a graduate of the Novosibirsk State Institute. A specialized sociological service is beginning to be formed in the association. Along with the personnel service it can take on the responsibility for the coordination of this work.

Problems of the organization of administrative consulting were raised at the round-table. Recently they have been discussed in a lively way in the press. Questions are raised about the status of the consulting organizations--this was discussed in PRAVDA of 19 August 1982.

Administrative consulting is an important and, so far, little developed business. The need to make it more active is increasing especially now when, implementing the decisions of the 26th CPSU Congress, the enterprises and associations are changing over mainly to an intensive basis of development. The effectiveness of consulting activity is known in world practice. Now there is the question of creating specialized autonomously financed consulting firms which could render assistance to enterprises in introducing effective methods of management.

Consultation work, when it is extensively introduced, can significantly raise the level of administration of enterprises. An important merit of consultation is constant contact between scientific and production workers. Just as active methods of study provide for more complete assimilation of information as compared to traditional methods, so administrative (and any other) consulting has a higher efficiency factor than ordinary research on orders from industry, whose results, as a rule, are only a written report. It is precisely because of the great effectiveness that consulting firms have become so widespread in the world. And this is precisely why they are necessary in our country.

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AKTYUBINSK X-RAY EQUIPMENT ASSOCIATION'S DIRECTOR VIEWS RESULTS

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 110-118

[Article by I. P. Shkurenko, general director of Aktyubrentgen Association (Aktyubinsk): "A View From Outside"]

[Text] Writing three years ago in a selection of materials entitled "The Plant--Through the Eyes of Consultants," I concluded an article with words to the effect that the idea of consultation firms was an old dream of mine and that I completely supported the suggestion of EKO about creating them. Unfortunately, this dream remained a dream: autonomously financed consulting organizations have not appeared during this time. But my conviction about the need for them has even increased, even though the idea of organizing their activity has undergone a certain transformation. I will explain my point of view by analyzing the results of our work with the EKO consultation brigade.

The consultants conducted an investigation of the plant, made a diagnosis and submitted their suggestions. They enriched us with interesting and serious ideas, but one must admit that the administration did not manage to realize all of them. To introduce ideas, in my opinion, is one of the important aspects of consultation activity. In this sense I attach a great significance to the press. We, like many other enterprises, extensively take advantage of information received from newspapers and magazines.

For instance, our specialists have struggled a good deal with the organization of the operation of the stock of modern equipment with numerical program control. And when they read in EKO No 1 for 1982 the articles by the general director of the Ivanovo machine tool building association, V. P. Kabidze, and the chief of the technological division for software, I. S. Maksimov, they understood that the Ivanovo workers have good experience and it is possible to obtain help there. Our brigade of specialists visited the Ivanovo machine tool builders and now they are introducing many of their ideas for organizing work of the stock of machine tools with numerical program control.

Active enrichment with ideas helps to raise the level of information for the manager which, from my point of view, is inadequate. Of course for the top manager himself to know everything in detail is unnecessary and burdensome. But it is necessary to have an idea of the general tendencies and directions as well as a general orientation about the best models of organization and administration.

I still recall how interested I was in an exhibit of new technological processes in instrument production which was organized at one of the meetings of the council of directors of the sub-branch. Everything I saw there--galvano-plastic, show-process, electro-erosion processing of metal, cold smelting--we have tried to introduce in our association during the past 2 years.

Another, no less important, aspect of consulting is the view of the enterprise from the outside through the eyes of competent people. It is my conviction that there is an urgent need for this approach, even when the enterprise is generally doing well. And perhaps it is when the enterprise is doing well that it is necessary to have this dispassionate view from the outside.

With time the manager and his assistants lose the clarity of their perception of problems which seem crucial to the new person. Here one must recall another effect--the so-called company patriotism. Every good phenomenon has its reverse side, including this one: we sometimes cease to see the advantages and merits of others who critically evaluate our activity. And in this respect it is very important to have a sobering unbiased opinion, of course, from people who are competent, whose authority is recognized by the enterprise.

Consultation of enterprises should be repeated at certain time intervals because working conditions and the direction of activity change, new problems appear and personnel change. The VAZ comprehensive system of administration and organization of production which we have introduced has changed many of our ideas and approaches to the solution of problems. But I am not at all convinced that everything has been done correctly in the association for centralization, specialization and concentration of production. There might also have been other paths. It would not hurt to conduct another investigation of the plant and to see how we look today after the introduction of the VAZ experiment. To whom should we turn? EKO cannot deal only with our association! We know of one other possibility: the Estonian consultation specialists. But they have enough orders from enterprises of their own republic. We do not know of any others to which to turn.

I must admit that we did not value all of the ideas expressed by the consultants and adopt them immediately. Time was also needed in order to interpret and realize them. But there is no doubt that these recommendations were not forgotten and that they constantly cause the specialist to return to their interpretation and utilization.

I remember that we had a dispute with the EKO brigade on questions of strategy. We regularly fulfill the state plan, and without adjustments; we invest a good deal of effort and energy in improving the well-being of our workers; we engage in the development of new items and improvement of the effectiveness of production. "Yes," said members of the brigade, "all that is good, but you are placing large goals before the collective, for example, the creation of items on a level with the best world models."

But still, the questions that were raised at the "round-table" discussion* were the subject of our thinking. When considering the plan for the 11th Five-Year Plan and problems of subsequent development of production, we were convinced that the experts were right: the strategy for further development can be based only on acceleration of the rates of scientific and technical progress.

During the period of the 9th and 10th Five-Year Plans we managed to do a fairly large amount to utilize organizational-economic resources (the introduction of methods of continuous operational planning of production, systems for control of the quality of labor and products, the VAZ experience). Because of this and also because of the work on renovation during the 10th Five-Year Plan the output of products was doubled. We exhausted all of the relatively simple reserves. It was necessary to dig deeper.

Under the 11th Five-Year Plan we will have to assimilate about 20 new items. They include the creation of equipment that is principally new for our association. With our former ideas I would have resisted, I would have found dozens of arguments to convince people that this is not our specialty. The fact that we are arranging to produce this planned equipment is a direct result of the discussion with the consultants. Moreover, we have come to a decision to create on the basis of this equipment a whole series of modern devices for medical x-ray equipment.

We have tried to determine just as clearly our positions in the area of industrial x-ray construction, but the inadequate coordination has still had its effect: each branch feels itself to be the master of the situation and dictates conditions that have no impeding factors. And the Gosplan agrees to include these sometimes poorly substantiated orders in numerous decisions. In words all efforts are directed toward proving the need to create a unified technological policy in the area of industrial x-ray work, but in deeds everything is the opposite.

Under the 11th Five-Year Plan we will have to do a great deal to improve product quality, to reduce material-intensiveness and energy-intensiveness of production and to increase labor productivity since increasing volumes in the association will take place practically without increasing the number of workers. Because of this the problem of technical re-equipment and technological improvement becomes especially crucial, and an entire program has been earmarked in this area. It consists of the following sections:

extensive introduction of industrial robots, and primarily into the production of consumer goods as the most mass kind of production in our association. During the five-year plan we intend to introduce 30 industrial manipulators;

active utilization of machine tools with numerical program control. We calculate that by the end of the five-year plan 50 percent of the lathe and milling work will be done on them;

*"And What Is To Be Included in Future Developments?" EKO, 1980, No 8.

the introduction of reduced-waste technology and the utilization of production wastes as a way of economizing on material resources and improving technological processes. The production of a number of parts has already been changed over to precision steel smelting instead of mechanical processing. It is intended to introduce powder metallurgy and smelting under pressure. In the second half of 1982 we began the output of toys made of metal scraps, and we plan to produce 140,000 rubles' worth of them in 1983;

mechanization of engineering labor. This is complicated work, but for successful advancement we must relieve the specialists of routine, uncreative labor. There is a certain reserve for this. In cooperation with the Novosibirsk Scientific Research Institute of Control Systems of our ministry we are creating an automated system for technical preparation of production (ASTPP). And although we have not achieved complete satisfaction with the development, the work is still proceeding. We assume that by the end of the five-year plan we will be able to automate the planning of no less than 80 percent of the technological processes;

a sharp increase in the return from instrument making and essential improvement of the quality of fittings;

completion of the work on the automated control system for the association. Under the 11th Five-Year Plan we should extend the automated control system to all main aspects of the association's activity.

In order to carry out this complex technical program it is necessary to have consultation assistance. We would willingly turn to experts who could evaluate the level of our technology, instrument production, mechanization and engineering labor and then help in developing plans for improving them.

Of course we see the majority of the shortcomings ourselves, but we do not always correctly diagnose the causes and determine the methods of treatment. And our people are not competent in all of the narrow areas of technical equipment. In mastering methods of powder metallurgy, introducing robot technology and other work which we have earmarked we need assistance from outside. But where do we find consultants?

Each branch resolves these problems in its own way. Some ministries have centralized work for mechanization and automation of production and have created enterprises and associations that design and manufacture for plants of the branch non-standard equipment, push conveyors and mechanized and automated warehouse complexes. For example, the Volgograd scientific production association Kompleks, which was discussed in EKO in 1979 or the scientific production association in Rostov (both of the Ministry of Tractor and Agricultural Machine Building) which was discussed in the television program Vremya. In other branches there is intensive development of powder metallurgy while still others are dealing with laser technology. But try to obtain concrete assistance! Showing and discussing--many enterprises will provide this for others. But to develop a plan, not to mention fittings or equipment--God forbid! They have enough troubles of their own. And, unfortunately, there are no interbranch firms for rendering such services.

In the stage of planning new productions the role of the consultant and advisor on scientific and technical problems is fulfilled to a certain degree by branch planning institutes. But since they cannot be specialists in all kinds of technology, these solutions are far from the optimal ones. In our ministry this is the Gipropribor--it generates all ideas when designing instrument building enterprises. But what about daily work when the need for assistance from experts arises?

It would seem that when developing technological processes and assimilating new items the plants could rely on the head scientific research institutes of the branch or the sub-branch. I will not try to generalize--I am not fully aware of the situation in other sub-branches--but our scientific production association cannot rely on such support.

We should also like to receive concrete assistance in solving certain economic and social problems. The diagnostic investigation conducted by the EKO brigade revealed a number of sore spots in production administration. In order to "treat" them it is necessary to have assistance from narrow specialists.

The branches have centers for scientific organization of labor. But from my point of view these are weak organizations which are unable to compete.

The problem of augmenting and retaining engineering personnel is very crucial for the association. Aktyubinsk has no technical VUZ's. We can only count on graduates of institutes in other cities. What measures we have taken to solve the personnel problem! At one time we tried to rely on Aktyubinsk boys and girls who had completed VUZ's in other cities. We gathered all of the information about where they had gone and turned to the Ministry of Higher Education requesting that they send them back after the completion of training to Aktyubrentgen. Of course we first had to obtain the consent of the future specialists and their parents. But the Ministry of Higher and Secondary Specialized Education did not meet us halfway.

Thus we did not succeed in increasing the influx of young specialists who have come from Aktyubinsk, but I still think that this would be the most reasonable method of solving the problem from all standpoints, including the social and regional ones. It is necessary to search out other ways of controlling the process of augmenting and retaining engineering personnel. And in this we need assistance from science.

Or take the problem of the automated control system. The consultants have encouraged us to take action in the development of automated control systems and to reorganize the ASU division. With the experience of operation of the Sigma ASU at the Altay plants they have convinced all managers of subdivisions that this system is appropriate for the association. It is precisely this and also the change in management of the information computer center that makes it possible for me to state with satisfaction today that during 3 years we have taken not a step, but a leap forward. But both we and the EKO brigade worked on selecting a system of organization that would help to adapt the Sigma ASU to our conditions, especially taking into account the VAZ system which we have introduced. The fact is that the development of the ASU is basically concentrated in branches, and there are no interbranch consulting firms to which one can turn for assistance.

The ASU was the only research project carried out during the process of consultation on the basis of the economic agreement. One could draw a conclusion about the inadequate effectiveness of autonomous financing relations in cooperation with science. With the introduction of a unified fund for the development of science and technology the responsibility of both sides should increase, but so far it seems to me that the responsibility of the clients has increased more: if the research project introduced into the plan for scientific and technical work (we are developing the ASU according to this plan) is not fulfilled, the production is deprived of certain goods. It would seem that the institute should be deprived of these as well. But the responsibility of the institutes for the introduction of developments into industrial operation has not increased. As before, they can limit their participation to scientific reports. They can deliver the report to the association "in concealed form" when the deadline for the project has expired, and go to any lengths to convince the client to accept and sign it, even if the material is rough and it is a long way from the concrete result. Not economic, but ordinary human relations are developed: somehow it is awkward not to sign it and to deprive people of their bonuses . . . moreover, the client is responsible for the failure to fulfill the research project just as much as the researcher is--he is also deprived of a bonus. And the associations and enterprises themselves when they release the innovation for industrial operation are responsible not for the conventional, but for the actual effect of the development. I am completely in favor of clear-cut and rigid contractual relations both with science and with consultants whereby funds are spent from the profit of the enterprise. Then the manager will be more cautious in evaluating the results of the work and, consequently, will spend money more thriftily.

And that which is done free of charge is received in the same way. Even our own small experiment in consulting shows this. In keeping with the assignment of the all-union production association we investigated one plant of our sub-branch and gave a number of recommendations; we received a lot of thanks and assurances that all of our suggestions would be utilized. A year passed and we found out that the plant had not made any changes. But money gives them the feeling that this is not a toy. Those who pay are more demanding of themselves and of the developers. By a decision of the branch, a base laboratory is being created at Aktyubrentgen for the dissemination of the VAZ experience to enterprises of the Ministry of Instrument Making, Automation Equipment and Control Systems. A small staff has been established. I think that the laboratory should be autonomously financed and each enterprise which turns to it for help should pay for its services. This approach, in my opinion, will be much more effective than the conscientious consultation activity that is financed with branch funds.

It seems that consultation activity should develop in the following directions:

diagnostic investigation of the object of control and assistance in selecting a correct economic and technical strategy;

an influx of new ideas and a higher level of information of managers and specialists in production;

diagnosis of individual sections and aspects of production and economic activity and concrete assistance in "treatment."

To do this, in addition to firms that specialize in investigation, economic diagnosis and assistance in solving strategic problems, there should be narrowly specialized organizations that develop particular aspects of economics and administration. And both kinds of organizations should be autonomously financed.

Judging from the number of enterprises that contacted us after the publication in EKO of the selection of materials entitled "The Plant Through the Eyes of Consultants," the interest and need for consultation work are immense. They have written to us and come to us from various regions of the country. I inadvertently became a "celebrity." Somehow at one conference in Dnepropetrovsk the secretary of the obkom when introducing my speech said: "This is the director of that plant which was investigated by the EKO brigade."

When meeting with managers of enterprises I frequently hear references to the fact that they would like to conduct an investigation of the enterprise and secure advice about the strategy for development, but there is nobody to turn to. And if there is a demand there should be supply! The creation of professional consulting firms for which expert activity would be the basic one, would contribute to raising the level of administration and increasing production efficiency.

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CENTRALIZING TRANSPORT, WAREHOUSING SERVICES ENTAILS LABOR, BOOKKEEPING CHANGES

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 118-122

[Article by S. T. Pachin, deputy general director for production (recently S. T. Pachin was appointed chief of the Aktyubinsk Oblast local industry administration) and V. A. Petrushanskiy, chief of the division for ASU: "Centralization of Transport-Warehouse Service"]

[Text] At the time when the EKO consultation brigade came to Aktyubrentgen we were all already conducting organizational transformations on the basis of the VAZ experience: we had centralized administration and brigades were created in all production subdivisions. The functional services of planning, organization and payment for labor, dispatching and technological and repair services were separated from the shops and centralized at the level of two productions--x-ray equipment construction and consumer goods.

It has happened that our productions are territorially separated and are located in two different ends of the city. True, during the past 3 years the association has made considerable progress in questions of re-equipment and capital construction. At the new site, where the entire complex for the production of x-ray equipment will be concentrated in the near future, along with buildings of the procurement and mechanics shops, the framework has already been constructed for the assembly building and the coating shop. But some of the finishing operations of the technological process--applying galvanized coverings and painting--are still being done at the old site. Plastic parts and non-ferrous castings are still being supplied for x-ray equipment construction by the shops that produce consumer goods. This second production is still territorially separated from the main one.

The distance between our facilities, on the one hand, and the small-series nature of the production of the main product--x-ray equipment--on the other, constitute certain specific features as compared to the VAZ mass flowline production, where everything is joined together by the main conveyor and follows its rhythm. Therefore, while following the VAZ principles of administration and organization, we had to adapt them to our conditions. This is why we turned to our consultants, particularly to the chief of the sector of the Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences, candidate of economic sciences, G. V. Grenbek, with a request for assistance in organizing continuous dispatch

of parts from shop to shop, control over their movement and accounting. G. V. Grenbek advised us to think of a variant for the creation of a centralized shop for transport and warehouse service (TSO) in which it would be possible to arrange complete responsibility for providing for the production of blanks and parts right down to delivering them to the working positions. Such a shop was created in the centralized production and dispatch division which is under the jurisdiction of the deputy general director for production.

How was the operation of the transport-warehouse business restructured?

All the shop storehouses and 2 central batching warehouses (TsKS No 1 and TsKS No 2) of both territories, transportation workers, and forklift operators were included in the staff of the centralized shop for transport and warehouse service (TSO). The organization of the labor of the transport and warehouse workers, like that of all other production subdivisions, is brigade organization. As a result of the centralization, the following structure of the TSO shop took form:

dispatcher service--2 people;

the transportation operator brigade--15;

the dispatcher operator brigade--9;

the warehouse operator brigade of shop No 1-4, No 2-8 and shop No 3--3;

the central batching warehouse brigade No 1--10 and No 2--14 people.

The storehouses and warehouses operate on one shift. Their task is to provide materials for the first shift throughout the working day, to prepare everything for the second shift and to deliver it to the working positions.

A unified transport brigade does the delivery. Its members are not assigned to subdivisions. On the contrary, the dispatcher service maneuvers the staff of the brigade, depending on the needs that arise.

The warehouse operators are organized into brigades according to the territorial principle, and each serves one warehouse or storehouse, which are located in the processing and output shops. The storehouse operators receive and store parts, keep card files for storehouse accounting, complete batches and issue procurements on request.

The delivery of parts along the technological route is handled by a unified brigade of dispatch operators. The members of this brigade work on the territory of all the processing shops. The dispatch operators receive parts from the controllers of the division for technical control, check on their actual number, load them on electric transportation and containers according to the route, and deliver receipts for the parts they have received to the information computer center.

The wages of members of the brigades of the TSO shop are paid according to the time-rate-plus-bonus system. The wages consist of a permanent part, which includes payment according to a rate, additional payments for working conditions and occupational mastery, and also a variable part, which includes additional payment for the fulfillment of the normed assignment and the plan for increasing labor productivity, and also a bonus for the quality of work and the art of production.

The additional payment for working conditions is established depending on the difficulty, heaviness and harmfulness of work in a given place. It is calculated individually for each worker in percentages of his wage rate.

The additional payment for occupational mastery is established in percentages of the wage rate according to the category of the main specialty that has been mastered and extends to all workers who have achieved high labor productivity and continually perform jobs in a related occupation. It is documented by an order of the director concerning the assimilation of a skill category in the related occupation on the basis of a decision of the brigade council.

The additional payment for fulfillment of the normed assignment depends on the level of its fulfillment and is calculated for each member of the brigade individually, in proportion to the time worked in percentages of the wage rate plus an additional payment for working conditions.

The normed assignment of the brigade of transport operators is the volume of shipments that provide for fulfillment of the plan of the shops of the main industry that are being served. For brigades of storehouse operators and dispatcher operators the normed assignment is the fulfillment of work for receipt, issuance, and dispatch of parts that provides for fulfilling the plan in terms of the products list by the shops that are being served. The fulfillment of the normed assignment is determined from the results of the work of these shops.

The additional payment for increased labor productivity depends on fulfillment of the volume of the normed assignment and the actual number of members of the brigade. It is calculated for each member of the brigade individually, in percentages of the wage rate.

The bonus for the quality of the work of the transportation operator brigade is established for observance of the rules for the operation of electric transportation and the established routes for movement, and the brigades of warehouse operators--for a correspondence between the actual availability of parts in the storehouse and the figures of the storehouse accounts, and for the dispatcher operator brigade--for observance of the established limit of losses. This bonus is calculated in percentages of the average monthly earnings of the entire brigade and is distributed among the workers by the brigade council.

Centralization of the transport and warehouse service has required improvement in the system of accounting and control of the movement of parts and procurements. A large role here has been played by the introduction into the processing shops of the "production" complex of the Aktyubrentgen ASU. For 3 years

the monthly normed assignment has been given to the procurement production brigades through the ASU and the fulfillment is also calculated through the information computer center.

The accounting is based on a check system. The parts that are manufactured and accepted by the OTK are given by the brigades to the dispatch operator of the TSO shop, and he makes a note of the receipt on all 3 copies of the check. Each dispatcher has his own stamp number, and therefore with the slightest imprecision in accounting one can immediately determine the source of the mistake. One copy of the check along with the parts and the release information goes to the storehouse, a second remains with the dispatcher, and a third is submitted to the information computer center. Thus there is no longer a need for the thousands of orders that previously had to be written. Moreover, the improved accounting has a great psychological influence. Having received a printout of the results of the work during the day at the beginning of the next shift, the brigades see that all checks for the parts they have manufactured have gone through the information computer center and have been accounted for in the fulfilled volume of the normed assignment.

The "production" ASU still does not include assembly shops of the association--they did not have card catalogs of proportionality which were the information base for the automated system. Assembly brigades are supplied from the central batching storehouse (TsKS) on the basis of the requests on a standardized form. Within 5 days before the beginning of the month the brigades submit requests to the TsKS. By the 26th of the preceding month the warehouse must provide the brigade with everything necessary for the first 10 days of the new month.

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| 1. Form 019--request | 7. Quantity |
| 2. Date: day, month, year | 8. Requested |
| 3. Entry number | 9. Issued |
| 4. Shop, institution, brigade - consumer | 10. Requested by |
| 5. Supplier of entry | 11. Issued, stamp of warehouseman |
| 6. Design designation of part (component) | 12. Entered into computer |

The association is now working on changing planning and accounting over to the ASU in brigades of the assembly shops. It has been decided to use the ideas of the Sigma ASU. The possibility of this approach toward automation of the control of the work of assembly brigades has been verified in one of the sections of the assembly shop.

Centralization of the transport warehousing facility and the introduction of the ASU of the "production" complex along with brigade organization of labor have made it possible to make the administration of operational production considerably more orderly. The accounting and delivery of parts to shops and working positions have improved sharply. There has been a considerable reduction in material losses. Previously the shops were in charge of the storehouses and it was difficult to account for the expenditure of procurements. Having wasted some procurements, the shop utilized others. Now the brigades are given procurements only for those parts and in those quantities which have been indicated in the assignment, and on the basis of requests that are documented on a special form.

With the creation of the TSO shop it was necessary to raise the level of mechanization of the warehouses, and to equip them in a different way so that the storage of parts and procurements and their delivery to the working positions did not require large expenditures of labor. Unfortunately, we had to do everything ourselves. The country does not have interbranch firms from which one can order a plan for the centralized transport and warehouse complex or make an order for equipment.

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ISSUE OF SURPLUS LABOR RESERVES ADDRESSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 123-125

[Article by V. P. Padenko and V. G. Chibrikov, AvtoZIL production association (Moscow): "No Two Months Are Alike"]

[Text] The annual program for the production shop and the plant is divided uniformly for all 12 months. Yet, as experience shows, during the summertime it is very difficult to fulfill it: many people take vacation during the summer, take examinations, undergo treatment, help their relatives on private farms, and so forth. In the summer workers are more drawn to agriculture and construction work. This does not take place without consequences: there is an increased percentage of slipshod work, equipment breaks down more frequently, and people are more tired. As a rule, labor turnover is also higher.

Usually the assignment for production subdivisions is planned in the amount of 80 percent of their potential capability. This takes into account the possibility of breakdown of equipment, shortage of personnel and interruptions in the supply of procurements and instruments. It also takes into account that the potential of the production unit is stable throughout the year. This is true with respect to equipment (although it too requires more attention on the part of repair workers during the summer). But the state of affairs with people is considerably more complicated.

An analysis of the movement of personnel during 2 years in one of the facilities of ZIL showed that the absence of workers practically coincides during the various months of the 2 years. With a number of workers that provide for a monthly wage fund of about 46,000 man-days, the shortage of labor force during the summer months sometimes reaches 19 percent of the personnel. There is a corresponding drop in the production potential. From the figure it is clear that during the summer months there is practically no reserve of labor force and all interruptions in the work must be covered with overtime, which is both tiring for the workers and costly for production.

Many managers deliberately strive to create a certain reserve of labor resources for the so-called "distraction of the labor force." Such a reserve exists at almost every enterprise, for otherwise it would simply not be able to fulfill the assignment. But when there is a permanent shortage of labor force, such an attitude toward the utilization of labor resources cannot but cause concern.

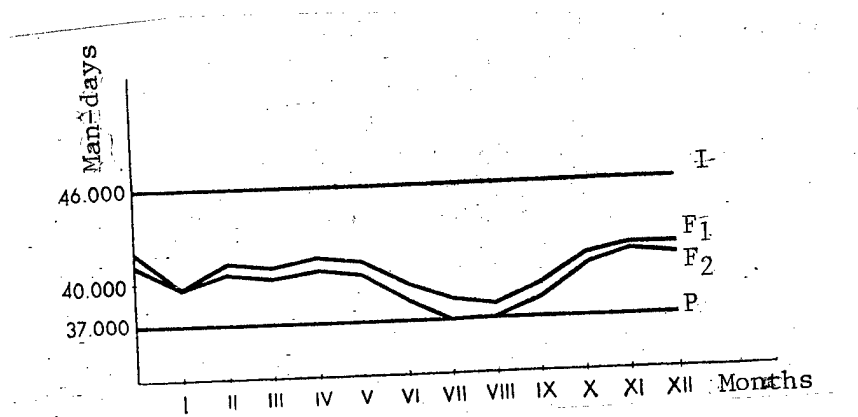


Figure 1. Distribution of the Supply of Working Time of One of the Facilities of ZIL for Various Months

- I - Average monthly registered supply of working time of subdivision;
- P - Supply of working time necessary for fulfilling the plan;
- F₁ - Actual expenditure of working time in 1981;
- F₂ - Actual expenditure of working time in 1982.

In order to stabilize the work of the enterprise throughout the year it seems logical to break down the annual plan not uniformly for the various months, but taking into account the actual possibilities of production. One can suggest, for example, the following variant of breakdown. For January, May, September and December the plans are received with the annual plan (Pg) divided by 12. Consequently in the numerator of the formula for determining the load for the other months one can use: for February, March, April, October and November--1.05 Pg; for June, July--0.92 Pg, and August--0.91 Pg.

It is clear that an individual enterprise cannot solve this problem independently. In order to supply the consumers uniformly, it must have the necessary reserve of procurements, and this depends on the supplier; additionally, not all industries have sufficiently large warehouses. The problem must be resolved for a group of enterprises that are joined together by a unified technological chain. A flexible annual plan will make it possible for the enterprises not only to stabilize the work, but also to release a certain number of workers (or redistribute them), which will contribute to improving the quality of the products and retaining personnel.

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CSO: 1820/129

'STANDARDS' CONTRASTED WITH 'ROUTINES'

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 125-127

[Article by S. V. Kreyter, candidate of technical sciences, All-Union Scientific Research Institute of Normalization in Machine Building, and Ye. S. Ulitova, psychologist, Scientific Research Institute of Labor (Moscow): "Standards and Psychology"]

[Text] Improving the quality of products and labor, as a rule, entails the introduction of a complex of the corresponding standards. But here is the paradox: why is there sometimes a negative attitude both toward the term itself and toward the existence of standardization?

It seems to us that the basis of this aversion is purely psychological in nature and is explained by a false interpretation of standardization.

There is no doubt that there is an area in human activity where standardization is unnecessary. This is the area of artistic creativity. But let us look into this sphere. For all the best that has been accumulated by mankind in these areas becomes a kind of standard of the highest quality--a model by which artists, poets and composers are guided in their creativity.

We mentioned artistic creativity precisely because people engaged in this area contribute more than others to a negative perception of a standard. This category of people, because of their professional activity, form the idea that a standard in any creativity is bad. And a standard is understood as a rubber stamp, a template. With the help of means of information this idea is subsequently transmitted to people who are engaged in other areas, they perceive it in ready-made form, and it becomes stronger.

Linguists, unfortunately, do not bring any clarity to this. Let us open the dictionary to synonyms in the Russian language and we will read: "banal, trite, perfunctory, stereotyped, standard, cliché, conservative . . . routine, template, standard" . . .

But if standard and conservative are synonyms, how does one define the meaning of the word "standard" in a positive sense? For it is precisely that positive role of standards that determines the immense significance they have in modern

life. It is no accident that the winner of the Lenin and Nobel prizes, academician N. N. Semenov, said that standardization is a scientific and technical language of modern science and industry which provides for mutual understanding, interconnection and intercoordination of various branches of the economy and production not only on the national, but also on the international scale. Consequently, it is necessary to have a very precise, objective and careful attitude toward propaganda of standardization which relieves this concept of its harmful nuances.

The social definition does not arise immediately. But when from childhood each day and without notice, first from parents and then from the means of mass information, the idea is instilled in us that the standard and standardization are essentially conservative and routine, the definition is transformed into one of the unrecognized motives of behavior. And even when the understanding comes that the standard is a measure, a motive force of modern progress, the residuals of the previous attitude remain.

At hundreds and thousands of enterprises we encounter daily violations of technology and failure to observe technical specifications. We are told that the reason for this is poor production discipline and inadequately high technical equipment. And this will be true. But behind the immense figure of violations of state and branch standards and technical specifications that are revealed by services of the Gosstandart at enterprises, in our opinion, there is the negative attitude toward standardization that has been instilled since childhood, unrecognized motivation for behavior which is reflected in the attitude toward the standard as a routine and a template and, consequently, the notion that it is not mandatory to observe or fulfill it. Of course a large amount of harm to the authority of standardization is caused by the poor quality of one commodity or another, even though they meet the established standards.

The magazine NOVYY MIR (No 5 for 1961) published an article by G. B. Borisovskiy entitled "Architecture And Technical Progress." In this article, in particular, it is written: "The standard has firmly entered our life. So firmly that sometimes we do not even notice it, just as we do not notice the air that surrounds us. Today the standard is necessary, we cannot do without it. If it were to disappear from our life, mass machine production would disappear with it, and we would end up naked and unclothed . . ."

"Had I been given the talent of a poet I would sing the praises of the modern standard in ringing verses filled with love and gratitude. I would present it in the form of a good genie who has the miraculous capability of making an expensive thing inexpensive. Similar to the way the Greek King Midas, if one believes the legend, with one touch transformed anything into gold, so the standard has the property of transforming a unique item into one which is mass produced and generally available. This is more than gold."

One cannot put it better! But the article has long been forgotten. Subsequently the publishing house "Standarty" published a book by G. B. Borisovskiy with the remarkable title "Beauty and the Standard," where the author brilliantly refutes the common assertion that beauty and the standard are incompatible. It is a pity that the book came out in a small edition.

Unfortunately, there is almost no literature that discusses standardization for children. The only exception we know of is an interesting book entitled "Entertaining Standardization" which was published in Leningrad. Even specialists are unfamiliar with it. The bases of standardization are not taught in the school either.

In conclusion I should like to say a couple of words to those who have become accustomed to taking a negative attitude toward standardization. Look around yourselves at work, on the street or in your apartment. Do you see many non-standard objects? And if some of them were manufactured without a standard, they were undoubtedly manufactured with observance of technical specifications which are also a normative document of standardization.

But we are surrounded not only with standard things. We are protected on the street by the rules of traffic, for road signs and road markers are made in keeping with the state standard, and at work there is a complex of standards in the area of labor safety. Even nature is protected by standards for environmental protection.

So let us remember: the standard and routine are not at all the same thing! And it is no small matter to take a correct attitude toward the standard!

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CSO: 1820/129

ON REDUCING LOSSES OF FOODSTUFFS IN STORAGE

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 1983 (signed to press 11 April 1983) pp 128-131

[Article by V. Ye. Choporov, Institute of Cytology and Genetics of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk), N. S. Gladkikh, director of the cheese plant, Maslyanino, Novosibirsk Oblast, and E. V. Fol', director of the cheese combine (Gorno-Altaysk): "Another Method of Reducing Losses of Products During Storage"]

[Text] Science has developed a method of protecting food products from mold and rot with the help of ionized air which has turned out to be effective and economical, especially when there are changes in the moisture and temperature conditions for the production processes and when, because of a shortage of water and an increased temperature, there is mass proliferation of microflora in the air of production premises.

The Institute of Cytology and Genetics has developed the design for the RIV-3 air ionizer. The effectiveness of its application for sanitary and hygienic purification of the air of the premises has been tested at cheese plants. Two plants of Novosibirsk Oblast were selected. These were constructed according to the single design and operate with the same technology. The Maslyanino cheese plant fulfilled the functions of an experimental plant and the RIV-3 ionizer was installed there, and the Boltovo cheese plant was the control enterprise. The results of the experiment in terms of technical and economic indicators are presented in Tables 1 and 2.

Table 1. Quality of Cheese at Maslyanino Cheese Plant, % of total in gross output

	Without ionization of air	After ionization
Highest grade	6.2	27.9
First grade	60.3	64.4
Substandard cheese	33.5	7.7

Table 2. Structure of Sold Products at Maslyanino and Boltovo Cheese Plants

	Boltovo Plant		Maslyanino Plant	
	First Grade	Highest Grade	First Grade	Highest Grade
Before ionization of air	85.4	14.6	90.7	9.3
After ionization	89.9	10.1	69.7	30.3

Along with a sharp improvement in sanitary and hygienic conditions for production and an increase in the output of high-grade products, another positive effect of using the RIV-3 is a sharp reduction in labor expenditures on caring for the cheese. Thus the production experiment conducted in 1979 at the Gorno-Altaysk butter and cheese combine, with minimum ionization conditions, showed that the reduction in labor expenditures on caring for the cheese because of the less frequent washing and drying of the products amounted to 12,500 man-hours in 3 months.

The preservation of food resources depends largely on the conditions for their storage. If the new technical decisions proposed by science and approved in production are disseminated more rapidly there will be a considerable savings on valuable food products. This can be seen from the example of a very familiar product--cheese.

The technology for producing it has been in existence for hundreds of years and has been constantly improved. But there has been a clear lack of development of means of protecting the products that are produced from the microflora in the air of the premises. Microflora have been accepted as an inevitable evil. The shortcomings of the technology which involves individual protection of the products that are being kept for completion of ripening and storage in chambers with air that is severely infested with microorganisms causes great material and labor expenditures. Individual coating with parafin, periodic (every 3-4 days) scraping of the heads of the cheese and washing them with warm water and ascorbic acid, packing them in domestic and imported polyethylene wrapping with subsequent repeated replacement of these wrappings periodic loading and unloading, the large expenditures of materials that are in short supply and expenditures of heavy labor of the workers in treating molding cheese--all this leads to making the products considerably more expensive.

But still the microorganisms are not completely destroyed, as a result of which the taste qualities of the cheese deteriorate, the normal biological processes are disturbed and the external appearance deteriorates. This sharply increases the expenditure of raw material on the production of each unit of product.

The replacement of labor-intensive and costly operations for caring for the cheese with less costly and more effective ones is of decisive significance in the economy of cheese production. In our opinion, no methods will produce an optimal solution until the technology itself for protecting cheese from mold and other microorganisms is principally revised. It is necessary to change

over to a technology for storing products in chambers with air that has been purified of microflora.

The air ionization technology that was developed for cheese production is also used for vegetable storehouses. On the basis of plant and laboratory research we have revealed the positive effects of ionized air on the sanitary and hygienic conditions of any food storage facility. This was proved by an experiment conducted in 1981 at base No 2 of the Novosibirsk city fruit and vegetable trade administration when storing sugar beets and potatoes. When the ionization device was turned on periodically (for 5 hours a day) the number of microorganisms in the experimental storage facility decreased sharply as compared to the control.

All one need do is take into account the difference in the technology for producing cheese and storing, for example, potatoes. In biochemical ripening of cheese the importance of oxygen in the air of the chamber is not great, while in storing vegetables and potatoes it is decisive. The application of the RIV-3 installation in potato storage facilities provides for long-term storage of the products without loss of valuable substances.

The conditions for applying the RIV-3 ionization installation are fully contained within the framework of existing sanitary rules. The technical conditions, the technical description and the instructions for assembly and operation have been coordinated with the Main Sanitary and Epidemiological Administration of the USSR Ministry of Public Health.

Since the equipment is installed in air conduits (the cost of home manufacture of the set of equipment is 1,250 rubles), it is not necessary to encumber production spaces or change the technology for loading and storing the products, and it is not necessary to restructure existing storehouses either. This facilitates mass introduction of the installation and maintenance of food products in high-quality condition throughout the course of the year.

We are writing in the magazine about the effectiveness of this method that has been developed because so far the new RIV-3 installations, like many other technological innovations in various spheres of the economy, is being disseminated extremely slowly and is not producing the return which it could with extensive introduction.

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MANAGER UNCOVERS NEGATIVE PERCEPTIONS OF HIMSELF AMONG SUBORDINATES

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 1983 (signed to press 11 April 1983) pp 131-133

[Article by I. V. Unzhakov, chief of sector for scientific organization of labor of the Orgproyekttsement Trust (Chelyabinsk): "The Director Decided to Look in the Mirror"]

[Text] I wish to share with you the solution to one problem which was set for me during the course of consultation on administration. The director of the cement plant came up against a problem: the shop chiefs, the head specialist and the head engineer began to resist his instructions. And, strange as it may be, when the plant was brought out of a difficult situation and got on its feet again there was no resistance.

Now it would have been possible to bend the will of the rebellious ones as soon as the plant began to operate stably (winners are not judged!), but the director asked me to help to explain the reasons before acting. Apparently it was a matter of the director's personal shortcomings, and in order to explain this I spoke with the chief of one of the leading shops, trying to find out the following:

if there were difficulties in the interrelations among managers of shop subdivisions;

if there were cases of multiple authority;

who the middle level would prefer to have as the first manager and why;

to whom the shops report about any events first of all--to the director, to the head engineer or to other managers;

what attitude the subordinates have toward orders for the plant;

how the plant administration reacts to failure to fulfill its instructions;

how the plant has achieved success, who has been in charge, led the staff and developed strategies;

if there is a clear-cut distribution of administrative duties.

The 7 shop chiefs and head specialists named by the manager whom he said he trusted most comprised the group of people questioned. In order to "start the conversation" with our shop chief, he was given a number of "easy" questions on which he has always had and expressed an opinion. For example, when he was asked about shortcomings, he named them and in passing also indicated those on whom the rectification would depend and to what degree.

The questionnaires were conducted thus. Recordings, as we know, pin down those who are questioned. Therefore, with their agreement, the answers were recorded after the end of the conversation. If the person being questioned refused to answer any particular question, we did not insist. But then in one way or another we obtained an answer, usually when touching on another issue. We avoided straightforward questions. For instance, in order to know which features the person values or condemns in a director or head engineer, it was sufficient to ask him to describe some other director or head engineer with whom he was acquainted or under whom he had worked previously. Usually the person being questioned frankly, extensively and clearly gave a description of "another" manager and inadvertently concentrated on those positive qualities which, in his opinion, were lacking in the present manager. We also made sure that the direct and indirect descriptions coincided. Only in this case was the opinion taken into account. We then showed our conclusions to each of those who was questioned.

Here are the negative features that were revealed in the director: he was supercilious, extremely sparing with praise, untrusting, he loved to put on an act, he entered into all shop trivia, he did not value his assistants, and he preferred to use monetary punishments. The head engineer was not always true to his word, he might deliberately insult a person, and he loved to say spiteful things.

Well, all right, we established this. But what else? The conclusions we made had to be made known to those characterized in an acceptable form. We were probably helped by the fact that even with the aforementioned shortcomings of the managers, the style of administration at the plant on the whole was democratic and the people were able to express themselves freely. It was thought that the credit of the director and the head engineer in advancing the plant were valued as equal (although in my opinion the director did much more).

And so we informed the plant management of the processed data and our conclusions. The discussion went well and with understanding. Everyone came to the conclusion that there was no cause to be surprised about the situation of conflict. As long as the plant was growing the shop chiefs and other managers put up with the autocratic style of the director, but today everyone assumed that he had the right to manage independently in his position, to express his opinion and to know that he was listened to and taken into account, that his work was being objectively evaluated and that he was given recognition for his services. The director was not confident or understanding enough, and he did not give enough recognition. The director agreed that the resistance was not against his strategy, but against his style of management, which needed to be changed.

Well, all he had to do was change his style, and the consequences--this is another matter. I have discussed only one consultation. The results of it will require study and . . . one more article.

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JAPANESE MODEL OF DEVELOPED CAPITALIST ECONOMY ANALYZED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 135-136

[Text] During past decades significant changes have taken place in the economy of the capitalist world. Developed capitalist countries can no longer, as before, carelessly exploit the resources of Asia, Africa and Latin America. The majority of countries of these continents have acquired political independence, the colonial system of imperialism has collapsed and the remnants of it are living out their final days.

The sphere of economic pressure of the imperialist countries is also decreasing. New independent states are oriented toward acquiring economic independence. The influence of the socialist countries on the world economy is increasing.

All this leads to an increase in the contradictions inherent in capitalism, and to an aggravation of the competitive battle. The two world wars have led to increased economic power of one of the capitalist countries--the United States of America. The U.S. economy retained a decisive significance for the capitalist world during the first postwar years. But by now the countries of Western Europe and Japan are undermining the leading position of the competitor across the ocean.

The conditions of capitalist reproduction are also changing. The rapacious extraction of raw material has led to a situation where many sources of it have been exhausted and expenditures on new resources are increasing at extraordinarily rapid rates. The previous structure of public production was not calculated for a possible reduction in the deliveries of raw materials, processed materials and fuel. The aggravation of the class struggle has led to an increase in expenditures on enlisting new labor force into production which is unfavorable for capitalists.

The forced rearrangement of the production structure is taking place tortuously and has led to a prolonged crisis and a decline in the rates of economic growth. Taking this into account, Japan's experience is extremely interesting. Although the rates of its development dropped, it managed to introduce into the economic structure changes that were calculated for intensification of production.

Socio-economically intensification of production in Japan has a clearly expressed capitalist nature. Japanese capital has brought into the sphere of its influence the extraction of raw material in southern Asia and Australia, it has penetrated the sales markets of other countries in a pitched competitive battle, and it is increasing the exploitation of the working class in the country. Still, the technical and economic tendencies in the development of production in Japan and the progress in its structure are being attentively studied throughout the world. They are also of some interest for our economists. Therefore the magazine has requested that one of the leading Soviet economists and Japanese scholars, Ye. L. Leont'yeva, discuss the intensification of production in Japan.

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PRIMARY & ENERGY RESOURCE USE, LABOR, FIXED CAPITAL REPRODUCTION & FOREIGN
TRADE ASPECTS

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in
Russian No 5, May 83 (signed to press 11 April 1983) pp 137-168

[Article by Ye. L. Leont'yeva, candidate of economic sciences, Institute of
World Economics and International Relations of the USSR Academy of Sciences
(Moscow): "Intensification of Production in Japan"]

[Text] The modern structure of the Japanese economy took form during 1955-
1970 on the basis of mainly extensive utilization of raw material, fuel and
labor force. During the second half of the 1960's there was a shortage of
labor force and a rapid increase in wages. All this, in addition to reducing
the possibilities of industrial build-up of the Japanese Islands with the
colossal increase in the cost of land, and also with the increased need to
restore the ecological balance, created conditions for changing over to
primarily intensive forms of economic development. But this changeover was
delayed by approximately a decade since Japan had still not encountered the
special difficulties in obtaining raw materials, fuel and energy.

The peculiarity of the Japanese economy consists in that it depends practically
completely on imported mineral and agricultural raw material and by more than
80 percent on imported primary energy bearers. But the prices of mineral raw
material and fuel on the world market, which were stable and even decreased
before the beginning of the 1960's, provided for stability of expenditures on
circulating capital. The strategy of the fuel and energy supply at that time
consisted in creating export branches which produced money to pay for large
volumes of imports. Thus by the middle of the 1960's the scale of exports of
products from metallurgy, machine building and chemistry increased so much
that from 1968 through 1972 Japan had the possibility of paying for its imports
while maintaining permanent assets in the foreign trade balance and increasing
its gold currency reserves 6.3-fold. And Japan's need for primary resources
increased to such a degree that it became one of the largest consumers of raw
material and fuel in the world: its proportion in the world imports of fuel
and raw material goods increased from 4.6 percent in 1950 to 13.6 percent by
the end of the 1970's.

Another way of supplying the country with raw material and fuel--organizing a
network of its own extraction enterprises and then processing the primary
resources abroad--is developing slowly. In supplying the most important

materials the proportion of import of resources produced by Japanese extraction enterprises outside the country stably comprised about 10 percent. The main method of supply was and still is commercial import.

But in the 1970's the situation changed radically. Import prices for mineral fuel increased 8.7-fold and for raw material--1.9-fold, while the overall level of import prices tripled. At the same time on the Japanese internal market the prices of raw material increased 3.5-fold and of fuel and electric energy--7.5-fold, but the overall level of wholesale prices only doubled. The profitability of a large group of material-intensive industries was undermined. Moreover, the prices for primary resources changed extremely irregularly. This brought about complete instability of the structure of outlays in Japanese industry, which before the beginning of the 1970's had practically no inflation: in 1955-1970 the average annual increase in wholesale prices amounted to 1 percent. The destabilization of the structure of outlays brought about a critical need to achieve a reduction of expenditures on raw material and fuel--the most unstable part of the outlays--both at the level of firms and branches and on the national level.

The reduction of the material-intensiveness of products as a result of technical progress was a typical feature of the Japanese economy even during the period of stable raw material and fuel outlays. The materials from interbranch balances of Japan in comparable prices of 1970 make it possible to evaluate the relationship between the annual expenditures of primary resources of raw material and fuel* and the final product.

Economizing On Primary Resources

From 1960 through 1975 the overall level of expenditure of primary materials decreased by almost half--from 0.234 units per unit of final product in 1960 to 0.123 in 1975. This was a great achievement in increasing the efficiency of the utilization of resources. In the U.S. economy, according to existing calculations, it would take 30 years to lower the level of expenditure of primary materials by 40 percent. Nonetheless the Japanese economy is still relatively material-intensive (in the United States this indicator is 0.067 units per unit of final product). The utilization of imported resources per unit of final product increased right up to 1970, and then began to drop.

The current production potential of Japan was formed on the technical basis of the 1950's and 1960's. Taking advantage of the best foreign technical achievements and their own developments, Japanese entrepreneurs constructed plants for primary processing of raw material (metallurgical, petrochemical, pulp and paper combines, thermal electric power stations, and so forth), extensively applying technological processes that are calculated for economizing on raw material and energy. Thus in ferrous metallurgy at the end of the 1960's there was a change-over to highly productive oxygen convertor production of steel and mass utilization of installations for continuous smelting. The assimilation of an immense

*The composition of primary resources includes products from agriculture, forestry and fishing and extraction branches minus intrabranh consumption, and also water supply and the production of electric power at hydro-electric stations.

list of rolled metal products and the creation of the "fourth redivision" in ferrous metallurgy contributed to reducing losses of metal during mechanical processing of it. The establishment of petrochemistry abroad during the 1950's and 1960's gave the Japanese economy new materials (fibers and plastics) that replace natural fibers, wood and metals.

The proportional expenditure of the most important materials per unit of gross domestic product, calculated in physical indicators for the period of 1960-1980, nonetheless shows extremely contradictory tendencies. During these 20 years the expenditures of hard coal per unit of gross domestic product decreased by approximately 63 percent, and timber--by 56 percent. This is a result of changing the energy base over to petroleum and gas and developing mass construction with the use of reinforced concrete. The proportional expenditure of iron ore increased 2.5-fold by 1973, and then decreased somewhat, reflecting first a growth and then a reduction in metal-intensiveness. But the proportional expenditures of petroleum per unit of gross domestic product during 1960-1973 increased 2.9-fold. This was explained by the fact that during the period of high growth rates, in order to provide for an increase of the gross domestic product of 1 percent it was necessary to increase the consumption of petroleum by 2.4 percent. After 1973 there was a reduction of the "petroleum-intensiveness" of the economy, and in 1973-1980 it was sufficient to increase petroleum consumption by only 0.5 percent in order to achieve a 1 percent increase in the gross domestic product.

The division of primary resources coming into the economy in terms of their value shows (see Table 1) that resources of vegetable and animal origin, which are used mainly in the food and light industry, fall behind mineral raw material and fuel, which comprise about one-third of the overall value of primary resources. Along with switching the economy over to resources of mineral origin there is a rapid increase in the role of imports in providing primary raw materials. In the 1970's their imports amounted to more than 35 percent.

A reduction of the need of the businesses for primary raw material and energy resources is determined not only by their economizing in the more energy- and material-intensive branches of public production, but also by the general directions of progress in the branch structure of the economy. For example, the decline in the metal-intensiveness of machine building items can be covered by an increased demand for metal construction elements and so forth.

Progress In Consumption of Objects of Labor

In the composition of the total gross output of all branches of the national economy during the 1960's and 1970's there was a sharp reduction in the proportion of products of agriculture, forestry and fishing, and also light and the food industry. The proportion of production and processing of resources of animal and vegetable origin in the branch structure of the output decreased during this period to 19.7 percent as compared to 32.5 percent at the beginning of the 1960's. The extraction of mineral raw material and energy resources, comprising an insignificant amount of 0.8 percent, dropped to 0.4 percent during these years. The most rapid increase was found in the proportion of branches of metal processing and machine building, whose share almost doubled during these 20 years.

Table 1. Branch Origin of Primary Resources in Japanese Economy in 1970
Prices, %

	1960	1965	1970	1975*
Resources of vegetable and animal origin	82.4	76.1	66.0	62.4
Including:				
Agricultural products	60.9	57.0	48.7	48.7
Timber	12.8	11.0	9.4	8.0
Fish products	8.7	8.1	7.9	5.7
Mineral resources	11.3	15.9	25.9	29.1
Including:				
Mineral raw material	5.7	11.6	14.1	16.0
Mineral fuel	5.6	7.8	11.8	13.1
Water resources	6.3	8.0	8.1	8.5
Total	100.0	100.0	100.0	100.0
Proportion of imported resources	13.2	20.3	31.9	35.1

*The figures concerning the branch origin of primary resources are obtained on the basis of an analysis of the interbranch balance. Information about interbranch flows are presented in report balances in physical terms or in current prices. In order to evaluate the structure of the branch origin of resources, it is necessary to translate the figures about flows into comparable prices. Such a translation is fairly labor-intensive, and at the present time economists have figures only for 1975. (ed.)

The changes that have been noted in the structure of the economy predetermined a change in the composition of consumed objects of labor in favor of industrial semimanufactured products. Their circulation in the economy relatively increased: in 1960-1965 this was equal to 92-93 percent of the volume of the final product, and in 1970-1975--105-110 percent, that is, expenditures of the intermediate product per unit of final product increased by 13-18 percent. The statistical indicator of the interbranch circulation contains elements of repeated calculation of objects of labor. But for a rough estimate of the structure of the interbranch circulation one can approximately divide it into levels of processing of objects of labor.

As a rule, there are still several stages of subsequent processing between the secondary objects of labor (ferrous and nonferrous metals, chemical materials and semimanufactured products, textile fibers, pulp, petroleum fuel and so forth) and the prepared items that go for final consumption and accumulation. In interbranch circulation there are items of intermediate demand: metal construction items, framework, parts and components of machines, individual sets of equipment that come for assembly, spare parts for repair, packaging materials,

semimanufactured consumer goods, electric energy and so forth. With accelerated development of machine building and construction there is an increase in the production of items of precisely this group. A comparison of the consumption of the mass objects of labor and electric labor per 1 million yen of gross national product (see Table 2) shows the increasing material and energy-intensiveness that replaced the reduction in the 1970's.

Table 2. Proportional Expenditure of the Most Important Materials and Energy Bearers per 1 Million Yen of Gross National Product in 1970 Prices

	1960	1965	1970	1975	1980
Steel, tons	0.87	1.00	1.25	1.08	--
Rolled metal, kilograms	536	521	649	516	500
Black copper, kilograms	12.0	10.4	11.2	8.8	11.0
Aluminum, kilograms	--	6.5	12.3	13.7	12.6
Cement, kilograms	801	757	750	665	683
Coke, kilograms	--	468	608	525	429
Petroleum products (liquid fractions), liters	1022	1848	2415	2180	1790
Electric energy (product consumption) millions of kilowatt-hours	2929	2573	2730	2560	2280
All kinds of energy resources, tons of conventional units	4.6	5.0	5.4	5.2	4.4

Progress in the Consumption of Energy Resources

The dynamics of the energy- and especially the petroleum-intensiveness of the Japanese economy is related to the peculiarities of the structure of the supply of energy resources and their utilization. The proportion of petroleum along with national gas in the energy consumption increased from 37.7 percent in 1960 to 77.6 percent in 1973. The changeover of the energy management to petroleum fuel and gas reduced the proportion of water resources from 15.3 percent to 4.6 percent, and coal, which was previously the basis of the energy management --from 42.1 percent to 13.7 percent. The extraction of coal was significantly curtailed. There was an increased dependency on imported energy sources, whose proportion in the primary energy balance doubled--from 44.2 percent to 89.9 percent. Among the industrially developed countries this is the greatest dependency on the world market.

The radical changeover to petroleum as the main energy source before 1969 was related to the reduced cost of petroleum in international trade and on the Japanese domestic market. They relied on cheap, easily available petroleum and, consequently, on the energy-intensive path of economic growth, whereby the dependency on imports was not burdensome for the country's payment balance. During the period between 1957 and 1969 the price level for petroleum for Japanese importers dropped by 48 percent, and in the next decade the prices of petroleum increased. The payments for purchased petroleum began to absorb an increasingly large part of the earnings from exports: 14.8 percent in 1970, 28.7 percent in 1973, and 43.7 percent in 1980 (4 percent of the gross domestic product). The "petroleum account" became the main reason for the shortage in the Japanese payment balance in individual years.

The proportion of primary energy resources processed for electric energy in Japan is higher than in the majority of industrially developed countries--it reaches 30 percent. Thermal electric power stations operate mainly on fuel oil, and the structure of petroleum distillation is adapted to their needs: 55 percent of the petroleum products are fuel oil and other heavy fractions used mainly as boiler fuel. And the structure of petroleum processing practically did not change in the 1970's while the proportion of industrial consumption of energy resources decreased fairly rapidly (see Table 3).

Table 3. Distribution of Fuel and Energy Resources Among Spheres and Branches of the Economy, % of Total

	1965	1970	1975	1980
Industry	51.2	49.3	45.7	43.1
Including:				
Ferrous metallurgy	15.6	18.0	17.2	15.1
Energy	6.4	6.9	7.6	8.0
Transportation	14.3	12.9	14.0	15.1
Agriculture, forestry and fishing	2.3	2.3	2.3	2.5
Domestic consumption	18.7	17.9	21.4	23.4
Nonenergy consumption	7.0	10.7	9.1	7.7

In the branch structure of the consumption of energy resources Japan is distinguished from the United States and Western Europe by a higher proportion of industrial consumption with a relatively smaller expenditure for transportation and domestic needs. This is explained by the high proportion of energy-intensive branches that process primary raw material (ferrous and nonferrous metallurgy, the production of cement, pulp, paper, glass and so forth).

The balances of production and consumption in physical indicators are published in Japan for a very small group of materials, which makes it impossible to make a detailed comparison of the tendencies of the material- and energy-intensiveness of production for individual branches and groups of branches. More convenient

for determining these tendencies is a series of indices of industrial production and consumption of objects of labor. It was discovered that between 1973 and 1980 the volume of output in the processing industry increased by 22 percent, and expenditures of all kinds of raw materials--by only 12 percent. Expenditures of thermal energy in the processing industry decreased rapidly, and those of electric energy, slowly.

Energy resources are becoming more expensive on the Japanese domestic market more rapidly than other objects of labor are. Between 1973 and 1980 their prices doubled, while at the same time the prices of raw material and semi-manufactured products increased by 40 percent. This causes industrial workers to economize primarily on energy resources and reduce energy expenditures. And the economy on raw and processed materials is achieved in passing, as a task of the second order. This is typical of ferrous metallurgy where they apply the greatest number of energy-saving decisions, such as changing over from fuel oil to coke in blast furnace production and mass dissemination of installations for continuous smelting of steel.

By the beginning of the 1980's they changed over to new energy-saving kinds of equipment in the production of cement and the smelting of aluminum (new types of furnaces and electrolytic installations). In other branches that consume a large quantity of heat (pulp and paper, chemical, glass and so forth) equipment is installed for salvaging utilized heat.

The possibilities of simple modification and augmentation of existing equipment without radical changes in technological decisions, which previously produced a significant savings on energy, are apparently exhausted. According to estimates of Japanese economics, in certain branches of the initial processing of raw material the average age of the technological equipment in 1980 exceeded the normal service lives. One can expect that in the first half of the 1980's when outdated equipment is replaced principally new energy-saving technologies will be introduced, which will make it possible to further reduce the relative consumption of energy resources in industry.

A reduction of the energy-intensiveness and primarily the consumption of petroleum in the economy even by the end of the 1970's stabilized the volume of importing of petroleum (in physical indicators), and in 1979-1981 lead to a reduction of it while there was a general advancement of industry.

Progress in the Reproduction of Fixed Capital

In the 1950's and the beginning of the 1960's, with relatively greater resources of labor force, the investment resources of the Japanese economy were limited not only by the constantly strained monetary market, but also as a result of the inadequate satisfaction of the demand for materials. The output of new kinds of metal items and equipment had to be arranged "from zero" for a large list of products of metal processing and machine building.

The period of mass construction of new enterprises and the establishment of new branches came during the decade of 1955-1965. During this period, as a result of the natural increase in the population and the mass flow of labor resources

out of the country, the number of people employed in nonagricultural branches increased by 8.9 million, or by one-third. The nominal earnings during this time more than doubled, and the value of fixed capital increased 4.3-fold. In other words, fixed capital increased more than the wage fund did by approximately 1.5 times. As fixed capital increased and the shortage of capacities was eliminated there was a changeover from extensive forms of reproduction of fixed capital to intensive ones.

In the processing industry between 1960 and 1970 the level of capital availability for labor tripled. By the end of the 1970's the expenditures on technical re-equipment were 5 times greater than those on the creation of new working positions, which was practically curtailed in industry after 1983. There was a persistent tendency toward an absolute reduction in the number of employees: during 1973-1978 their number in industry decreased by 14.5 percent. But the annual fund of working time in Japanese industry is 2,140-2,160 hours per one worker, which is 10-12 percent higher than in the United States and England, and 20-25 percent higher than in France and the FRG. This partially compensates for the reduction of the number of workers.

In the processing industry the processes of technical re-equipment and crowding out of labor force went especially far. In the 1970's a number of branches, including trade and the sphere of services, continued to have a high demand for labor force. The front of extensive development as a result of enlisting new labor resources shifted to the service branches which displayed a great "absorption capacity."

Since the beginning of the 1960's the proportion of expenditures on construction in the composition of capital investments of a production nature has decreased in favor of equipment. This accelerated the recouping of capital investments and increased the demand for machine building products as compared to construction materials and construction work.

From 1960-1978 the proportion of products of construction dropped from 62 to 39 percent, and there was an especially significant decrease in the proportion of road construction work and engineering facilities. In the composition of machine building products, which covers the investment demand, the role of general industrial, specialized and electrical equipment is increasing.

During the period of high growth rates, expenditures on replacement of fixed capital that had been discarded amounted to 3-5 percent of the value of the capital, or 25-30 percent of the gross capital investments. The remaining 70-75 percent went for the creation of new capacities. The annual increase in fixed capital as a result of the immense investments of the extensive type in the 1960's reached 15-20 percent. The new capacities at least doubled the value of the discarded ones. This extensive type of investment process made it possible by 1970 to rejuvenate the structure of fixed production capital. The average age of it in 1970 was rated at 8.2 years for the entire economy, and 7 years for the processing industry. The demand for capital investments, which involved numerous interbranch ties, in the 1960's increased the demand for construction products. The subsequent reduction of these related capital investments was accompanied by a changeover to the intensive type of reproduction of fixed capital.

Prepared for by the preceding stage of development, this changeover accelerated rapidly during the 1970's under the influence of the new prices. The market conditions create objective stimuli for changing the types of utilization of resources. During the preceding period the wholesale prices for equipment, raw material, fuel and semimanufactured products were practically stable. Consequently, the risk of large investments was relatively small as well, which stimulated extensive growth of production capacities.

But as this process developed in Japanese industry there was a shortage of labor force in the more widespread occupations, which, according to evaluations of 1967-1968, constitute 18-20 percent of the available workers and employees. The Europeanization of the way of life in the country rapidly expanded the group of vital needs of the population. A certain increase in the wages with stable prices for the remaining elements of expenditures became the strongest stimulus for labor-saving investments--for economizing on live labor which was the resource that was in shortest supply and was rapidly becoming more expensive.

During the 1970's the structure and dynamics of prices changed sharply. Between 1975 and 1980 the prices for fuel and energy resources almost doubled, and the level of wages rose by only 50 percent. The cost of raw material, semimanufactured products and construction materials increased by approximately 40 percent, and the level of prices of equipment--by only 10 percent. This ratio in the dynamics of prices and earnings simultaneously dictates a material- and labor-saving type of capital investments. New construction became more expensive than re-equipment of enterprises. The dynamics of the ratios among prices for resources orients entrepreneurs towards primarily the capital-intensive path of investment with preferential savings on live labor, raw material and processed materials.

In the 1970's there was a change in the dynamics of fixed capital and the nature of investments. The annual growth of fixed capital on an average for all branches decreased during the decade by approximately half. And expenditures on replacing outdated equipment and replacing live labor with the work of machines began to increase rapidly. With unstable raw material and fuel-energy outlays, after the burst of inflation that was experienced in the middle of the 1970's, the risk of costly plans was no longer justified by the expectation of large new markets and high profits. The proportion of expenditures on means of mechanization and automation in the overall sum of gross capital investments increased 1.5-fold, and expenditures on replacing discarded equipment and capital repair more than doubled. Another evaluation of the structure of capital investments (only in terms of the processing industry) decodes certain articles of expenditures, including the replacement of withdrawn means of labor (percentage of total):

	1975	1980
Increase in capacities	30.9	36.4
Mechanization and automation	23.5	28.2
NIOKR	5.1	10.8
Capital repair	12.9	17.3
Installation of purification equipment	24.1	7.1
Expenditures on safety equipment	--	6.6
Economizing on energy	--	6.6
Other purposes	3.5	20.6

As one can see, many items of expenditures on the replacement of discarded means of labor are generally not intended for increasing the output of products. Expenditures on mechanization, automation and economizing on energy are made primarily in order to reduce current expenditures. Expenditures on purification equipment and safety equipment increase current expenditures without producing a direct commercial return.

With a high proportion of expenditures on replacement and qualitative improvement of capital, capital investments do not create the related interbranch needs for subsequent investments. They are more autonomous and place smaller demands on production construction and, consequently, on the output of design materials, mass shipments and so forth, that is, in terms of complete expenditures they are less material-intensive.

It is mainly the active part of the production apparatus that is renewed--working machines, transportation equipment and so forth. There is also an increase in the average age of fixed capital, including passive elements. During the 1970's the age of fixed capital in the Japanese processing industry increased from 7 to 8 years. It still has a certain advantage over the United States, where the average age of fixed capital in industry is estimated at 10 years, but without large new capital investments it can amount to nothing. True, in the 1970's they made a stride that was not accounted for statistically but was extremely significant in equipping enterprises with the latest kinds of electronic instruments for automation and control of technological processes and organizing all-around control of the quality of assembly at machine building enterprises. Thus while the cost of fixed capital doubled, expenditures on electronic equipment in the capital investments increased 4.5-5-fold. According to existing estimates, in 1980 Japan took first place in the world in terms of the stock of robot manipulators applied in the economy (75,000 units or 70 percent of the world stock) and it concentrated in that country 51 percent of the stock of machine tools with numerical program control. The output of robots is increasing by 40-50 percent annually.

With the extensive type of capital investments the time periods for the construction and assimilation of the capital investments in Japan were shorter. The residuals of incomplete construction at the end of the year during the period of 1965-1970 amounted to only 17-20 percent of the annual allocations for capital investments. The level of the load on capacities reached 93-95 percent during the year of the increase. In the 1970's 23-25 percent of the annual volumes of capital investments were contained in the construction cycle, and the level of loading of capacities in industry was within the range of 78-85 percent. The replacement of capital that had been withdrawn in general produces a smaller quantitative increase in output than does the startup of new capacities. All these new parameters of the investment process were not slow in being reflected in the effectiveness of fixed capital.

The coefficients of capital-output ratio calculated for the gross national product show a stable deterioration of the return from fixed capital from the very beginning of the 1970's. At the end of this decade, in order to obtain a unit of gross national product they put into action 30 percent more fixed capital than at the beginning of the 1960's. In the 1970's the fixed capital

of the Japanese economy became considerably less productive: the existing capacities are utilized intensively, and the new ones are becoming more expensive.

The early orientation toward imports of primary resources with stable world raw material prices made it possible for Japan to economize on resources invested in the extraction industry. This provided for a relatively great effectiveness of capital investments.

Market conditions which direct them primarily toward economizing on raw material, fuel and labor resources, conditioned the profound qualitative restructuring of the already created production apparatus in the direction of intensification. Also, because of the large disproportions in the regional development, there is still a need for large capital investments in the infrastructure, especially in the assimilation of new territories and the road network. Being applied along with the general reduction of the effectiveness of accumulated capital, these investments with long terms for recouping lower the overall level of returns from current capital investments. While retaining the norm for accumulation at a level exceeding 30 percent, in the 1970's in order to provide for the same increase in the gross national product it was necessary to expend 2.8 times more resources. Evaluations of the capital-intensiveness of the increases in the gross national product show that Japan has to a significant degree lost the advantage in the effectiveness of accumulation as compared to other developed capitalist countries.

It is necessary to make up for the increased cost of capacities by expenditures of public labor that are increasingly complex and involve higher skills. The material base created in Japan during the 1970's, which is characterized by innovation and a high technical level of fixed capital and the formation of a skilled labor force and a scientific and administrative potential, made it possible for the Japanese economy to enter onto the path of compensation for unreproduced natural resources with better quality reproduced ones. In the modern stage of development of the Japanese economy the interconnection between the capital-intensiveness and material-intensiveness revealed elements of a closed circle which can be overcome only by changing over to the capital-saving variant of intensification. Japan can provide these prospects for itself, on the one hand, by the development of branches with more complex "science-intensive" technologies which accelerated in the 1980's and, on the other hand, by the possible curtailment of branches of primary processing of materials through including industrial semimanufactured products in imports.

The Role of Foreign Trade

The volumes of complete expenditures per unit of components of the gross national product show a high material-intensiveness of export trade. This is a direct result of the existing division of labor between the Japanese economy and the rest of the world.

Japan has entered the ranks of the main consumers of agricultural and mineral raw material and fuel. Its proportion in the world consumption of primary resources rose from 13.7 percent in 1968 to 17.7 percent in 1977. Therefore

the significance of the tendencies toward material-intensiveness in this country go far beyond the national boundaries. Japan's foreign economic relations are based mainly on interbranch division of labor whereby it performs complete processing of imported raw material and the exporting of a large list of manufactured products.

Imports satisfy the needs of the Japanese economy mainly for circulating capital. Imported equipment covers only 5.4 percent of the investment demand for machine building products; imports satisfy only 6.3 percent of the population's demand for durable goods and 5.2 percent of the demand for prepared food products. Changes in the commercial composition of imports as a whole are in the direction of reducing the material-intensiveness of the economy. There is still a high concentration of commodity flows in imports too: petroleum and petroleum products (more than 30 percent), metallurgical raw material (6.6 percent) and timber (6.2 percent). If the prices of raw material and energy resources were to remain at the 1970 level, in 1979 Japan would have been able to spend only 28.8 percent of the entire cost of imports on actually imported raw material and 17.5 percent on fuel (total 46.3 percent).

The reduction of the material-intensiveness which is being manifested in the economizing on primary resources is still far from compensating Japan for the increased cost of them in world trade, although this tendency is already in effect.

In the commercial composition of Japanese exports there is a steady increase in the proportion of equipment (29 percent in 1965 and more than 40 percent at the end of the 1970's) and durable consumer goods (17 and 25 percent, respectively). On the whole the proportion of machine building products in exports increased from 45 to 70 percent. There is a reduction in the proportion of such large export items as industrial semimanufactured goods as compared to the prepared items of machine building. Products of light industry (mainly textile), which comprised Japan's main export potential in the 1960's, have almost completely lost their significance.

The internationalization of economic ties increases the export orientation of the Japanese processing industry. For many commercial groups the 1970's brought about a stable increase in export quotas. Japan sells 49 percent of its transport machine building products on foreign markets, including 50-55 percent of the output of motor vehicles. A number of branches of general and electrical equipment machine building and instrument building export more than half of their products: textile machines (more than 80 percent), bearings (more than 60 percent), standard current generators (80 percent), photography and movie equipment (more than half) and watches (70 percent).

During the 1970's branches began to export which previously did not enter into foreign markets: machine tool building (export quota--more than 40 percent), the production of metallurgical equipment (35-40 percent), and many kinds of equipment for multibranch purposes (pumps, compressors, lifters and so forth). This is related to the tendency toward increasing the export of sets of plant equipment, which comprised 5 percent of the overall sum of Japanese exports in 1970 and 12.5 percent in 1979.

During the course of the postwar years the changes in the branch structure of Japanese industry made it possible to update the commodity composition of exports by constantly increasing the export potential as a result of the latest products. This tendency continues in the 1980's.

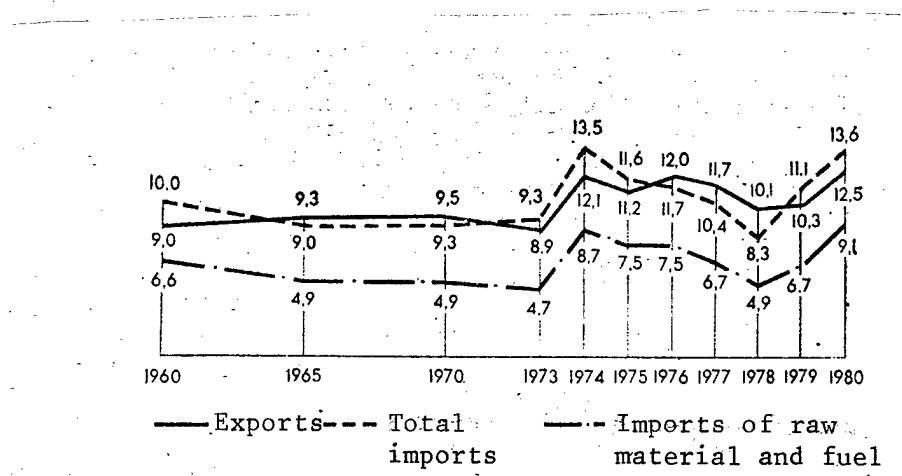
The high export quotas now stably characterize the structure of the majority of the branches of Japanese metallurgy and machine building which serve no small part of the world market. Japan is the supplier of 15 percent of the machine building products and more than 20 percent of the metals that come into international trade. The value of machine building exports of items for investment purposes in 1975-1978 was equal to 63-67 percent of the domestic volume of capital investments in equipment. In other words, the capacities of Japanese machine building exceed the country's internal investment needs by two-thirds.

The increased export potential in all of the machine building branches helps Japan to overcome the increase in world prices on raw material and energy resources.

The figure gives an evaluation of Japan's foreign trade dependency, measured by the relationship between the volumes of trade and the gross national product. The rise in world prices for raw material and fuel in 1974-1975 and fuel alone in 1979-1980 each time increased the proportion of imports in the gross national product and increased the sum of expenditures on payment for energy resources.

The more rapid rearrangement of the branch structure of the Japanese economy, which began in the 1970's, is preceding in the directions of economizing on line labor resources, raw material and energy, and compensating for them with high-quality resources of fixed capital. This is a relatively capital-intensive path of development which retards the rates of the country's economic growth. But it has enabled Japan to overcome the deterioration of price conditions in foreign trade exchange, to radically update its exports and to partially lessen the destabilizing influence of the world market.

Indicators of Japanese Foreign Trade, % of Gross National Product



How Are Energy Resources Saved?

Japan's new raw material and energy policy which took form at the end of the 1970's is arranged on the following principles:

recognition of the limited possibilities of growth with the instability of prices and other conditions of raw material and fuel-energy supply;

the concept of "economic security" which consists in stabilization of the resource supply and the creation of insurance reserves. To do this it is necessary to force exports of capital into raw material branches, to diversify sources of commercial imports and to change over to energy sources and alternative petroleums;

measures for changing the structure of the consumption of raw material and energy resources which include incentives for economizing in each working position, rearranging the branch structure and the direction of efficient utilization of primary resources and maximum liberation of them from import dependency.

The concept of rearranging the branch structure of the Japanese economy is presented in detail in long-term predictions of the economic structure and the structural policy published by the Ministry of Foreign Trade and Industry. The goal of the measures envisioned in these documents is to transform Japan into one of the major world centers of technical progress. Its economy should gradually be freed from material- and labor-intensive industry, and the development of highly technological "science-intensive" branches is encouraged on the basis of its own scientific and technical potential.

To a certain degree the Japanese state subordinates its functions in the area of foreign economic ties, its scientific and technical policy and intervention in the development of the branch structure to the regulation of the country's supply of primary resources and their utilization.

Previously favorable conditions of technical renewal were created for pure business, the domestic market was protected from international competition, and selective assistance was given to the new growing branches and the unprofitable branches that were tending to decline. The selective principle was realized in a number of state branch programs (in the 1950's--for ferrous metallurgy, electric energy, ship building and transportation; in the 1960's--for petrochemistry, the aviation industry, electronics and so forth), which envisioned direct and indirect measures of state support (the allowance of cartels and mergers, going around the antimonopoly legislation, preferential credit and tax shelters, accelerated amortization of equipment). The goal of branch regulation at that time was to optimize the scale of output and to provide for narrower specialization of enterprises. The legal basis for the implementation of these measures were the numerous "laws on temporary measures." It is interesting that before 1973 economizing on energy and raw material was not even mentioned in these laws. Of the 16 economic laws enacted from 1951 up to the present, only 3, adopted since 1973 for the energy economy, pertain to the energy supply and the utilization of energy resources.

Along with the liberalization and expansion of foreign economic ties the protectionism which was arranged under petty bureaucratic control subsided to the background. The circles of entrepreneurs lost their motivation for this as they caught up with the West technologically. But branch regulation still continued to make adjustments in the functioning of the market and exerted an influence on the formation of the modern branch structure.

In the 1970's, when they began to curtail production in unprofitable branches, in the relations between private capital and the state apparatus they began to establish mainly an informal style of "administrative regulation" which was based on a recognition of the authority and competence of state bureaucrats and on a mutual coordination of interests. The administrative staff in Japan retained its right to take legally documented measures in the most responsible area, namely in the energy policy. On the whole the utilization of energy resources is regulated by the state more than other primary resources.

The traditional instruments of branch structural policy, particularly tax and amortization benefits to private enterprises when purchasing equipment have also begun to be oriented toward economizing on resources. They have always been applied selectively, only for a strictly determined group of enterprises, according to previously drawn-up lists of equipment to be written off. These benefits extend mainly to the following objects: purification equipment; equipment that provides for reduced energy-intensiveness and replacement of petroleum and gas with other energy resources; petroleum storage equipment, and laboratory equipment used for scientific research work. But the actual application of tax and amortization benefits is not great: in 1980 they comprised only 0.5 percent of the actual sum of private capital investments. In 1981 the system of tax benefits and accelerated write-off was extended to practically all kinds of energy-saving devices.

Along with measures of a legislative and administrative nature that are applied to private business, priority scientific research projects are being carried out for the utilization of alternative energy sources.

In order to provide for continuous supply, a system of mandatory petroleum reserves is functioning. Such reserves were created for the first time in 1968 in the amount of 45 days' worth of consumption, and then this period was increased several fold and by 1979 it was increased to 90 days, and 1980--to 104 days (97-day reserves of private firms and 7-day reserves for the state petroleum corporation). A special law which determines the policy for financing and storing reserves went into effect in April, 1976. The reserves are maintained and augmented partially through the budget, they are distributed according to quotas among all private petroleum processing companies and they are under the jurisdiction of the joint state and private company for petroleum reserves which is responsible for construction and operation of petroleum storage facilities.

A complex of legislative and administrative measures, recommendations to private business (which have compulsory force in Japan) and control on the part of the Ministry of Foreign Trade and Industry is directed toward increasing the efficiency of the utilization of energy resources. Soon after the first sharp

increase in the prices of petroleum, a temporary law was enacted concerning optimization of the supply of oil, which envisions coordinating the plans for the production of petroleum products with the ministry, the introduction of quotas for the consumption of petroleum by large firms, and several other extraordinary measures. The proposed standardization of retail prices for petroleum products was not adopted since the government rejected direct control over the prices (except for controlled tariff for electric energy). Direct control over the prices would mean budget subsidies on a large scale which is practically unrealistic with an immense budget deficit. The Japanese state limited its functions to tax measures, financing the NIOKR in energy, and administrative control, and it did not follow the path of budget financing of the restructuring of the energy business itself. The lack of direct control increased the role of the market mechanism in conditions for economizing on energy and changing over to energy-saving kinds of equipment.

In October, 1979 a law went into effect concerning efficient utilization of energy. It proposed 80 criteria for the operation of energy equipment for which the enterprises were obligated to give account. At large enterprises they introduced mandatory staff positions of energy engineers with functions of controllers, they established special control over enterprises that are large consumers of energy, and they established more rigid standards for the consumption of energy and fuel by household appliances and passenger vehicles.

Additional tax measures have been taken: accelerated write-off of power installations and tax shelters for owners of automobiles, depending on the power of the engine and the expenditure of fuel; the speed of motor vehicles has been limited to 80-100 kilometers per hour on the highways and 50-60 kilometers on the rest of the roads; state control has been introduced over the quality of petroleum products, and so forth. According to the estimate of the Ministry of Foreign Trade and Industry, the effect of the program of recommendatory and administrative measures in the 1981 fiscal year was reflected in saving 25 million tons of petroleum--this is approximately 8 percent of the annual consumption. In 1980 increasing the load on atomic electric power stations to 60 percent of their capacity saved 3 million tons of conventional fuel.

Measures for encouraging NIOKR in the area of economizing on energy resources have been reduced to a single program (the plan "Moonlight"), and the stimulation of the development of new sources--in the plan "Sunlight." These plans are being developed in scientific research institutes under the Administration of Science and Technology, and they are intended for up to the end of the 20th century. In the overall sum of budget expenditures on NIOKR, expenditures on financing and subsidizing work in the area of energy engineering amounted to 12 percent in 1974-1975 and 14 percent in 1979-1980. In 1980 a new item of expenditures was introduced into the expenditure part of the state budget for replacing petroleum with other kinds of energy resources.

In the "Sunlight" plan the most promising variant is considered to be the development of liquid fuel from coal or combustible coal gas. For Japan, which does not have sufficient deposits of coal the fate of this plan will be determined largely by the relative dynamics of world prices for coal.

A most important new source of energy for the country is atomic energy. But its development is proceeding fairly slowly and involves many difficulties. The country's population is actively protesting against the construction of new atomic electric power stations. There are also difficulties in providing the branch with nuclear fuel.

Japanese industrialists consider the main task in the development of atomic electric power stations that are now operating on imported raw material to be to create an independent cycle for utilizing nuclear fuel and their own network of breeder reactors, enriching plants, warehouses and so forth. Government plans also earmark the rates of development of nuclear power engineering so that by 1990 they will be relieved of petroleum resources in the amount of 25 percent of the annual volume of consumption.

Long-term predictions of Japan's needs for energy resources from year to year are being revised by the government, taking into account the increasing savings on energy sources. The prediction published in 1980 envisions savings by 1990 (as compared to 1977) in the amount of 14.8 percent of the total need. At the end of 1981 the estimate of the proposed savings by 1990 was increased to 23.4 percent.

Within the framework of the aforementioned predictions of the structure of the economy and the recommendations in the area of the structural policy, reliance is placed on a change in the consumption of energy resources. It is expected that in the 1980's the proportional expenditure of energy sources in the branches of primary processing of raw material will decrease by 1-2 percent per year, and along with the changeover to new sources of energy and the overall structural effect from reducing the proportion of energy-intensive branches, the scope of losses of energy resources during processing, distribution and utilization will decrease from 43.8 percent in 1978 to 37 percent by 1990. The dependency on imported petroleum in the stage of final consumption of energy can be reduced to 45 percent by 1990.

With all this in the 1970's the actual path toward economizing on energy resources consisted primarily in rigid control of the utilization of energy, which was dictated by the colossal increase in retail prices of bearers of energy. This control was introduced by private business and was ensured mainly by the market and only to a small degree by special state measures.

Strictly speaking, when there is a need to curtail one kind of production or another the object of state regulation is not the branch, but the firm or group of firms for which the state facilitates a changeover to another production which is more profitable. Japan has no overall legislative base for this policy. The legally formulated system of assistance for this changeover exists only for small enterprises. But as a temporary, extraordinary measure, this assistance is organized at the level of the branch or group of branches.

In 1978 the Ministry of Foreign Trade and Industry made a group out of 14 branches that were declared to be "structurally depressed" and a series of medium-term programs for restructuring which were combined into one "Special Extraordinary Law Concerning Structurally Depressed Branches." The law pertains to the following branches:

the most energy-intensive (smelting of aluminum, aluminum, open-hearth and electric steel;

those that consume fuel oil as an initial raw material (production of nitrogen fertilizers and chemical fibers from petroleum products);

those that are suffering from the world crisis in shipping (ship building, maritime transportation);

the most labor-intensive branches that are experiencing competition from developing countries (the textile and sewing industry, and the production of veneer and cardboard).

At the end of the 1970's these groups of branches had a large reserve of unutilized equipment. One-third of the capacities for smelting aluminum stood idle, and in ship building--about 60 percent. The ministry drew up a program for reorganizing these branches, including the release of equipment for scrap, the transfer to state insurance supply, the merging of firms, and the coordination of plans for capital investments and updating of equipment. After agreement with the branch and regional unions of entrepreneurs, the ministry established for each of these branches specific calendar plans for disassembling the equipment (the so-called stailization program) with preferential bank credit. In essence a system was created for antidepression branch cartels under state leadership. This system undoubtedly played an important role in the curtailment in 1978-1979 of such material- and energy-intensive branches as aluminum smelting, petrochemistry and the production of open-hearth and electric steel.

The continued increase in world prices for petroleum and the sharp fluctuations in the exchange rate of the yen again destabilized the situation of the branches of primary processing. The developing countries that extract raw material are trying to increase its processing locally (the countries of the Persian Gulf are constructing petrochemical plants, Venezuela, Indonesia and Brazil are constructing plants for nonferrous and ferrous metallurgy, and so forth). It was discovered that the course toward curtailing production and changing over to importing semimanufactured products in Japan was impeded by the fact that initial processing is done at multibranch combines and the disassembly of the capacities directly influences related production. Moreover, the situation in various branches became extremely diverse. As a result of the reduction of the demand for petroleum products among the "structurally depressed" branches, the processing of petroleum decreased. The continued increase in prices led a number of petrochemical industries and the pulp and paper industry into the same situation. But in ferrous metallurgy, for example, the situation did not come to this because of the mass application of energy-saving equipment.

In developing the extraordinary law concerning structurally depressed branches they are considering the plan "extraordinary measures for enlivening certain branches," which earmarks benefits for the petrochemical industry and expansion of budget financing for the development of new kinds of energy.

The fate of many branches engaged in primary processing of raw material remains unclear because of the extreme instability of the change in prices on raw material and energy resources. Moreover, the majority of enterprises of this category were constructed at the end of the 1960's and the beginning of the 1970's and are characterized by a high technical level. The branches of initial processing are now experiencing a deep crisis. This involves ultramodern industries in which Japan occupies the leading position in the world. Experts of the Ministry of Foreign Trade and Industry think that the problem now consists in stabilizing the situation in these branches with the help of short-term measures and then developing a policy for their long-term restructuring, taking into account the competitive situation in each of them.

And so, what measures have enabled Japan in a relatively short period of time to change the economy over to intensive forms of economic development?

Through means of state-monopolistic regulation the proportional consumption of energy, raw material and processed materials was decreased. But this did not stimulate a reduction of the consumption relative to the achieved level. Additionally:

preferential financial conditions were created for the introduction of economical new technologies;

the system of increasingly rigid standards made it necessary to eliminate industrial facilities that had a high expenditure of resources;

energy-intensive and material-intensive branches were partially curtailed and they began to acquire these products abroad.

The scientific research of state and private scientific research institutions was directed toward creating technologies that provide for a changeover to the intensive path of development and a number of state special-purpose programs were oriented toward the development of new energy sources.

This path turned out to be capital-intensive. Therefore there is an increased proportion of embodied labor, which places more rigid requirements on investments. In this connection:

there is a stimulation of the introduction of capital with a high proportion of the active part;

primarily reconstruction is encouraged, and not expansion of production capacities;

it became impossible to introduce facilities that have a high expenditure of resources per unit of output.

These elements of the Japanese experience merit more detailed study.

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GRAPHS ILLUSTRATE SECTORS' TEMPORAL DEVELOPMENT

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 169-176

[Article: "Japan in the Capitalist World"]

Figure 1. Average Annual Rates of Increase of Gross Domestic Product, %

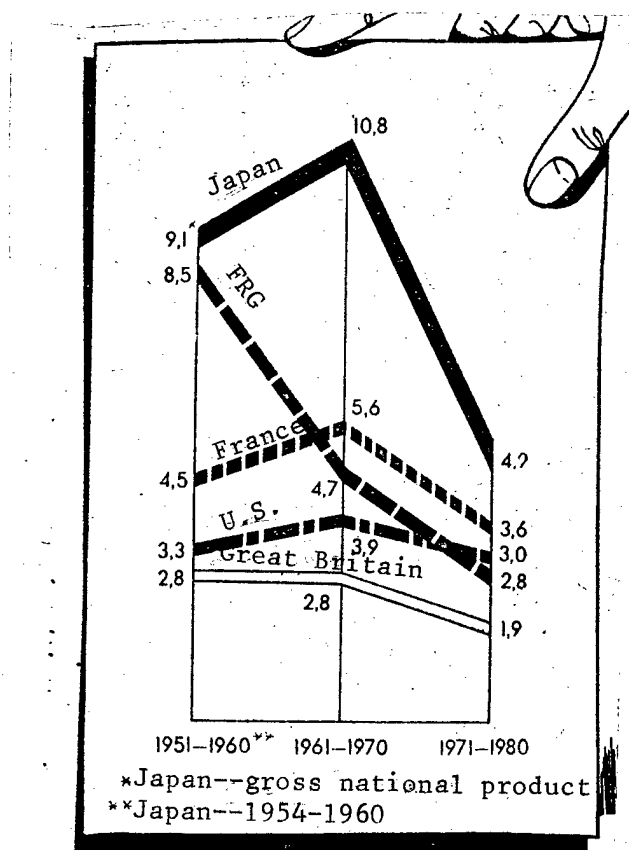


Figure 2. Average Annual Rates of Increase of Industrial Production, %

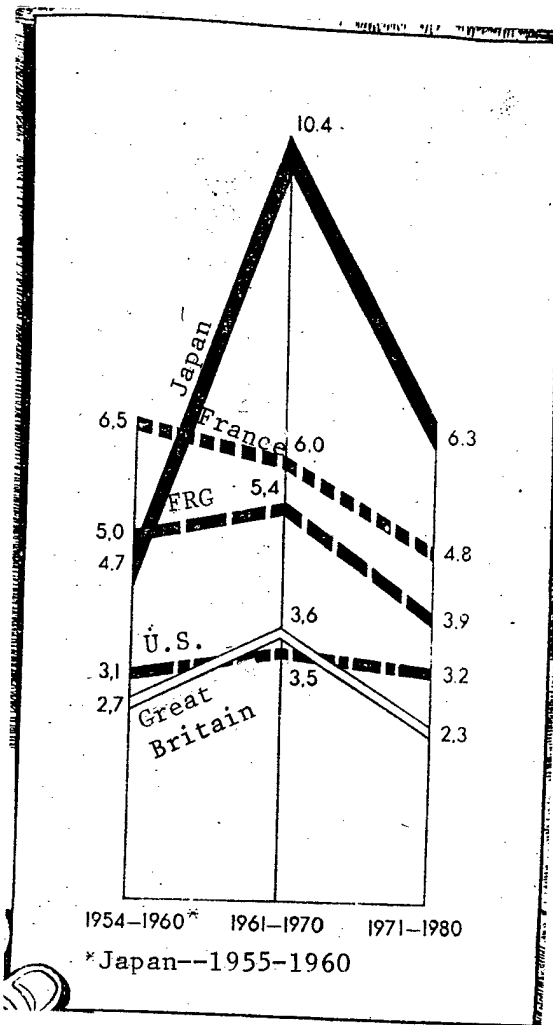


Figure 3. Average Annual Rates of Increase of Labor Productivity, %

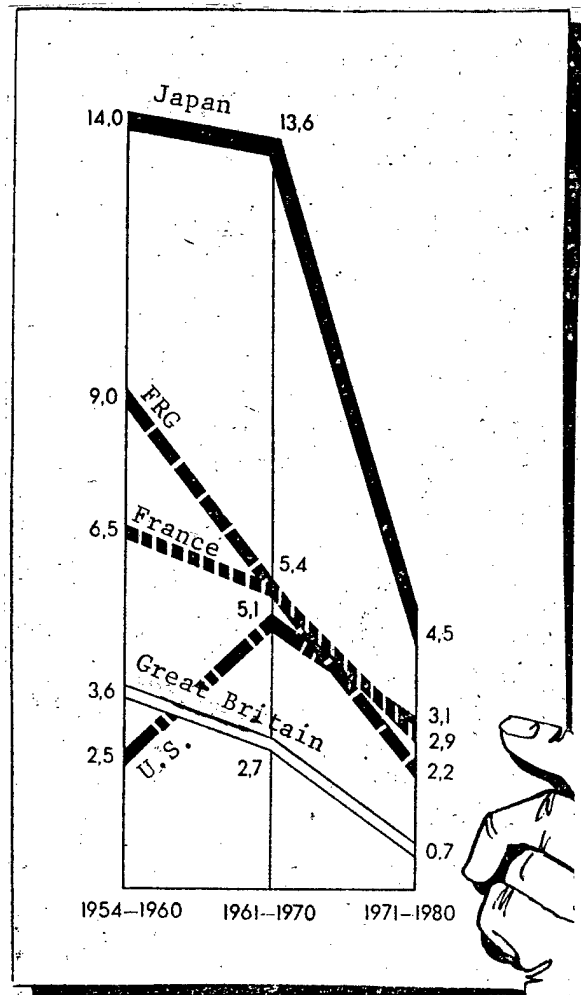


Figure 4. Average Annual Rates of Increase of Foreign Trade Turnover, %

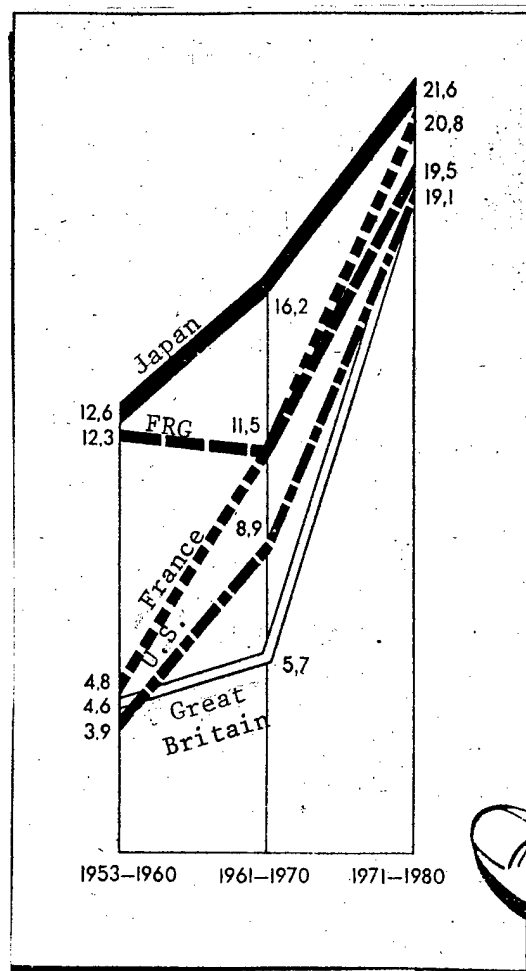
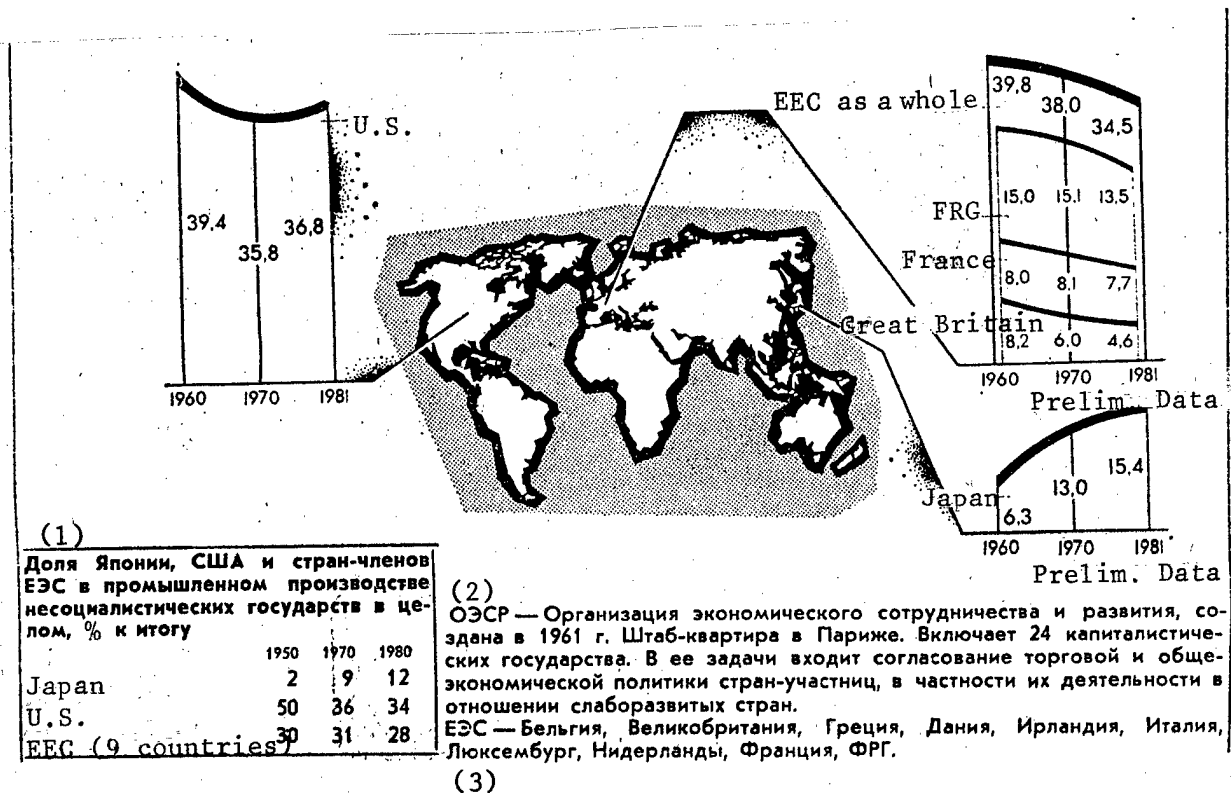


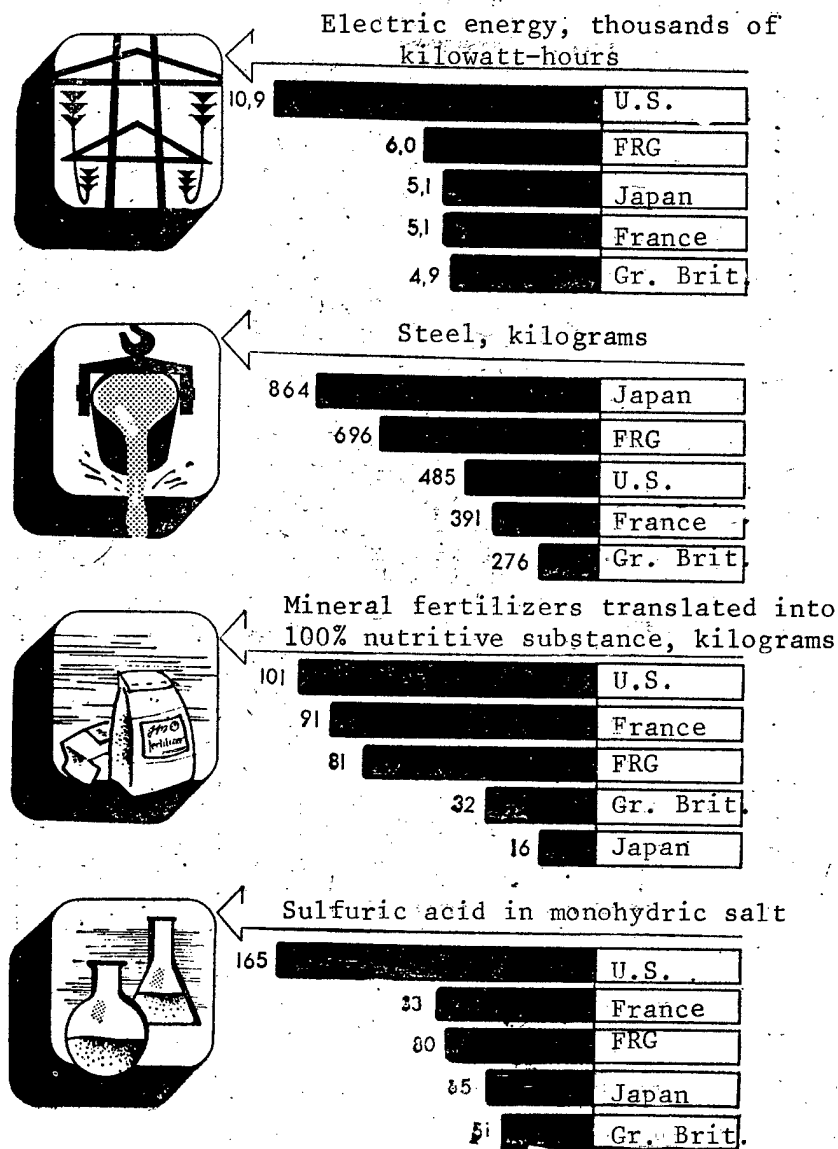
Figure 5. Proportion of Japan, U.S. and EEC Countries in Industrial Production of OECD Countries, % of Total



Key:

1. Share of Japan, U.S. and EEC countries in industrial production of nonsocialist states as a whole, % of total
2. OECD—Organization for Economic Cooperation and Development, created in 1961. Staff headquarters in Paris. Includes 24 capitalist states. Its tasks include coordination of trade and socio-economic policy of participating countries, particularly their activity with respect to underdeveloped countries.
3. EEC—Belgium, Great Britain, Greece, Denmark, Ireland, Italy, Luxembourg, the Netherlands, France and the FRG.

Figure 6. Production of the Most Important Kinds of Products Per Capita in 1981.



(Figure continued on next page)

Figure 6 (continued)

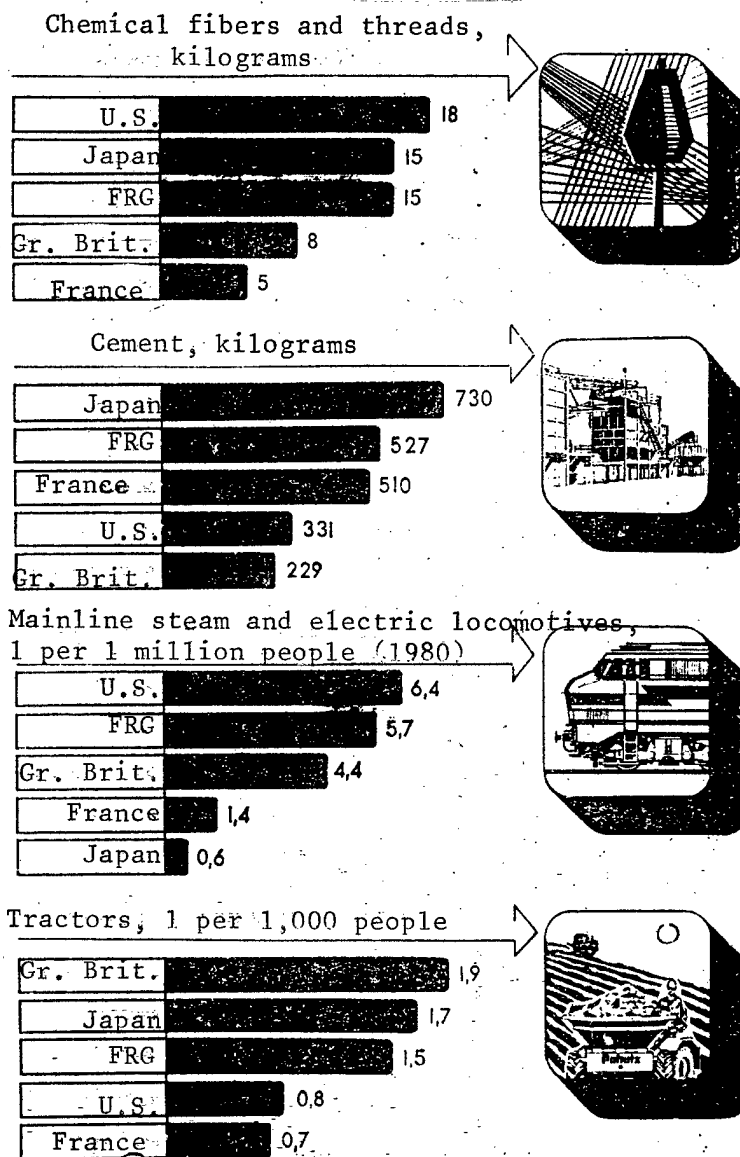
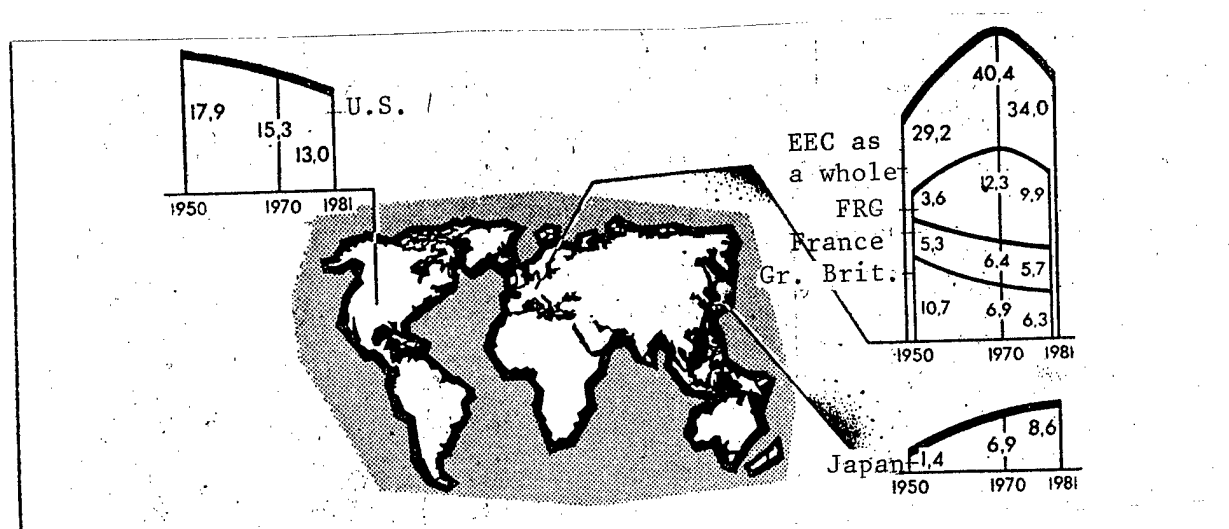


Figure 7. Share of Japan, U.S. and EEC Countries in Total Exports of Nonsocialist countries, % of Total



The change in the shares of the three centers of imperialist competition appears more clearly if one takes total exports of only the industrially developed capitalist states: In this the share of the U.S. dropped from 27.3% in 1950 to 17.1% in 1980, and the share of Japan and the EEC countries increased from 2.2 to 10.2% and from 43.6 to 51.9%, respectively.

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BOOK ON SOVIET PARTICIPATION IN SOCIALIST INTEGRATION REVIEWED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 177-186

[Review by I. V. Dudinskiy, doctor of economic sciences, professor, International Institute of Economic Problems of the World Socialist System (Moscow), of the book "SSSR i sotsialisticheskaya ekonomicheskaya integratsiya" [The USSR and Socialist Economic Integration], ed. by A. I. Zubkova and V. M. Shastitko, Moscow, "Nauka", 1981]

[Text] The large amount of literature devoted to problems of socialist economic integration has been augmented with one more interesting and useful book.

Entering the second decade of the implementation of the Comprehensive Program for integration, the CEMA countries are experiencing as never before the need for generalization and scientific analysis of the experience that has been accumulated in the sphere of their mutual economic ties. Both the strong aspects of cooperation and problems that persistently require a solution have been disclosed and studied.

A decisive role in the development of integration is played by the USSR, which has at its disposal a powerful economic and scientific-technical potential and consistently adheres to a policy of active participation in international socialist division of labor. The Soviet Union accounts for 65-70 percent of the global national income and industrial production of the CEMA countries; it has immense reserves of natural minerals, the products from whose development are shared with countries of the socialist community.

The overall intent of the work under review--to reveal the position, role and significance of the USSR in the development of integration--has been embodied in its plan. The first part is devoted to investigating the peculiarities of the formation of the USSR national economic complex and its inclusion in international socialist division of labor. The second section presents problems of USSR participation in scientific-technical and production integration, and analyzes the influence of integration on the development of the branch and territorial structure of the country's national economic complex. Individual chapters are devoted to USSR cooperation with CEMA countries in the most important branches of the national economy--fuel and raw materials, electric

energy, metallurgy, the chemical industry, machine building, the production of consumer goods, the agro-industrial sphere, the development of transportation and the area of science and technology.

The book is filled with factual material. But attention is drawn to this fact: the book was signed to press in June 1981, and a considerable part of the time sequences contained in it end in 1978-1979.

The unity and diversity of processes of collectivization of production and labor in the national and international spheres are considered in the first chapter, which gives a detailed description of international production relations; subsequent chapters are thus based on a firm theoretical foundation. But a number of points in the first chapter are disputable. Thus, when giving their understanding of international cooperation of labor the authors proceed from the idea that division of labor and cooperation in it are not related to one another as content and form are (p 11): division of labor only creates prerequisites for the appearance of cooperation in labor. Yet the entire logic of the presentation leads the reader to the conclusion that cooperation of labor in the sphere of the interrelations among the CEMA countries is nothing other than a particular transformation of unified division of labor when it goes beyond the framework not only of individual enterprises, but also of national boundaries.

The work convincingly shows the process of the formation of the USSR national economic complex and reveals progressive structural changes both at the national economic level and at the level of individual branches. The process of the formation and improvement of the structure of the USSR national economic complex with the formation of the world socialist system is experiencing the increasing influence of international socialist division of labor, and the scope of our country's participation in world division of labor has also expanded. In turn, the Soviet industrial potential exerts an increasingly significant influence on the process of expanded reproduction of the CEMA countries. This influence is multifaceted. On the one hand the Soviet Union has rendered a great deal of assistance to the CEMA countries in creating their own industrial base. At the beginning of 1980, with the participation of the CEMA countries, more than 2,200 large industrial enterprises and other facilities have been or are being constructed, of which 1,300 have already been put into operation (p 57). On the other hand, many branches of the processing industry of these countries are based on deliveries of Soviet fuel and raw material. They include, above all, the petrochemical industry, ferrous metallurgy, machine building and the textile industry.

The book devotes attention to the fact that USSR participation in cooperation is not limited to deliveries to the CEMA countries of objects and implements of labor. The Soviet Union plays an exceptional role in the sales of the products produced in these countries. The immense internal market of the USSR, to which a considerable volume of goods produced in the CEMA countries is sent, is a most important condition for the normal functioning of the economies of the fraternal countries. The USSR purchases 33 percent of the machine building products exported by the CEMA countries, 26 percent of the chemical products, 33 percent of the foodstuffs and 43 percent of the industrial consumer goods

(p 60). Thus the economic interaction between the USSR and the other CEMA countries has reached a stage in which one of Marx's well-known points is applicable: "Trade acts here no longer as the activity which is accomplished between independent producers and serves for exchange of their excesses, but as an essential, all-embracing prerequisite and aspect of production itself."* The entire book is pervaded with the idea that mutual ties among the fraternal countries should contribute to increasing the effectiveness of public production. This is the point of view from which all problems of further participation of the USSR in international socialist division of labor are examined.

One of the serious problems is the need to overcome the "structural barrier" in the economic ties between the USSR and the other CEMA countries. The essence of this amounts to the fact that the USSR enters the world socialist market primarily as a supplier of an ever increasing quantity of fuel, energy and raw material, and as an importer of products of the processing industry of the other CEMA countries. Up to a certain point in time this system was based on the rapid growth rates of the extraction branches. But the possibilities of increasing exports of fuel and raw material cannot be unlimited. Moreover, expenditures on the development of the extraction branches are increasing rapidly as a result of the changeover to the exploitation of more and more distant deposits with difficult access and the increased expenditures on transportation. According to estimates presented in the book, in 1971-1975 capital investments to provide deliveries of fuel and energy commodities from the USSR to other CEMA countries amounted to 6.7 billion rubles, and in 1976-1980--14 billion rubles (p 62).

The book notes that the strategy of economic growth of the CEMA countries is based to a certain degree on the possibilities of acquiring fuel and raw material at low prices and on their general availability. But since the middle of the 1970's this situation has changed. A sharp increase in prices for fuel and raw material has made it necessary to view in a different way the fuel and raw material problem of the countries of the socialist community (p 156).

In the situation that has been created it has become obvious that the existing structure of production and consumption of fuel and raw material goods in the CEMA countries needs to be improved and is not sufficiently oriented towards solving such global strategic problems as reducing the material-, capital- and labor-intensiveness of the products that are produced. It does not fully contribute to a relative reduction of the consumption of kinds of fuel, raw material and processed materials that are in short supply in the countries which do not have the necessary volume of the corresponding resources. If the index of the level of the proportional expenditure of energy per unit of final social product in the FRG is taken as 100 percent, in Hungary it will be 114 percent, Czechoslovakia--145 percent, and Bulgaria, the GDR and Poland--152 percent (p 63).

*Marx, K. and Engels, F., "Soch." [Works], Vol 46, Part 1, p 385.

The book reveals the main paths to solving the fuel-energy and raw material problem. It is emphasized that its solution for the future cannot be based on a simple increase in Soviet deliveries of fuel and raw material to the CEMA countries. An expansion of these deliveries involves the realization of new forms of cooperation, particularly joint construction of large facilities in extraction branches of industry. Long-term special-purpose programs for cooperation regarding fuel, energy and raw material contain a complex of inter-coordinated measures in this area.

Thus these programs set the task of continuing investigation of the prospects of territories of the CEMA countries that have petroleum, gas and coal, including the shelves of the seas and oceans, and they envision measures for fuller extraction of mineral fuels from the earth, primarily petroleum and gas.

The strategy for solving the fuel and energy problem in the 1980's, as envisioned in the long-term special-purpose programs, presupposes a considerable expansion of cooperation in the coal industry. This is related to the fact that it is becoming increasingly clearly understood that the resources of petroleum and gas can be exhausted, and the world supplies of coal will last for several hundred years (p 159).

In recent years the countries of the socialist community have made great efforts to increase the efficiency of the utilization of fuel and energy resources. Capital investments in this sphere, as the experience of a number of countries shows, are considerably more effective than are the expenditures necessary for additional extraction of an equivalent quantity of fuel. Within the framework of special-purpose programs measures have been earmarked for expanding cooperation in the development and introduction of new technical decisions that provide for economizing on fuel and energy resources.

It is noted in the book that planned organization of the division of labor makes it possible when solving the fuel and energy problem to take more extensive advantage of such possibilities as coordinated rearrangement of the structure of national economic complexes of the CEMA countries through reducing the proportion of energy-intensive industries in the countries that have unfavorable conditions for their development (p 164). Unfortunately this important thesis was not sufficiently developed in the book and the reader can only guess what specifically lies behind it. It would also be good if the book gave a more clear-cut evaluation of the role of atomic energy in solving the fuel and energy problem and the decisive significance of the USSR in the matter of constructing a series of atomic electric power stations in the CEMA countries. Obviously a clearer presentation of this problem was also impeded by the fact that the fuel and energy problem is considered in one chapter and cooperation between the USSR and the CEMA countries in the development of electric energy is considered in another one.

Considering the structure of international socialist division of labor, the authors point out that it is not sufficiently direct toward increasing the effectiveness of public production and does not fully contribute to reducing

the consumption of kinds of fuel, raw material and processed materials that are in short supply or to efficient satisfaction of the growing needs of the CEMA countries for high-quality products of the processing branches.

It is noted in the book that under these conditions exceptional importance is attached to the coordinated structural policy which is being followed by the CEMA countries and is directed toward raising the level of interstate specialization and cooperation of production and increasing the interaction and mutual complementation of the branch structures of the national economy (p 121). Subsequently this thesis is disclosed in chapters devoted to an analysis of the condition of the division of labor in individual branches of the economy.

A significant part of the book is devoted to an analysis of the cooperation between the USSR and the CEMA countries in the area of machine building. It shows the leading role of machine building in the industry of the CEMA countries and also the forms and methods of development of international specialization and cooperation in the production of the fraternal countries.

Characterizing the method for increasing the efficiency of the machine building complex of the USSR, the authors correctly assert that not only the progress of our economy, but also successful development of the national economy of other countries of the community depend on the solution to this problem. Concentrated in Soviet machine building are 92 percent of the machines and equipment and blast furnaces produced in all the CEMA countries, 64 percent of the metal cutting machine tools, 87 percent of the excavators and so forth. Our country delivers to the CEMA countries a large quantity of modern machines, including mining, energy and metallurgical equipment, agricultural machines, means of transportation, trucks and cars, and so forth. But the proportion of machines and equipment in Soviet exports to the CEMA countries amounts to 26 percent (p 204).

The authors should have noted that these figures show the possibility of increasing the role of USSR machine building in the development of socialist integration. There remains the task of more actively including the USSR machine building complex in international socialist division of labor and in the processes of international specialization and cooperation.

The figures that are presented show that Soviet purchases of machines and equipment in the CEMA countries are steadily growing. In 1979 they reached 9.4 billion rubles as compared to 182 million rubles in 1950 (p 205). These purchases play an important role in the development of certain branches of the Soviet economy, including machine building.

An analysis of the condition of international specialization and cooperation in machine building production of the CEMA countries shows that during the years when the Comprehensive Program for integration has been in effect important positive strides have been taken in this matter. This is confirmed, in particular, by the steady increase in the number of agreements concluded, including large-scale ones. Still, the state of cooperation in this area does not yet meet the requirements either of our country or of other CEMA countries (p 217).

Specialization and cooperation of production have little influence on optimization of the structure of the machine building complexes of the CEMA countries. Many agreements do not envision the creation of new kinds of machines and equipment, but only reinforce the existing structure of deliveries.

Further progress in specialization and cooperation of production involves the implementation of the long-term special-purpose program for cooperation in the area of machine building and the bilateral long-term program for production specialization that has been concluded between the USSR and other CEMA countries. Under these conditions the USSR assumes an even greater role as the organizer of cooperation in the main areas of scientific and technical progress.

The book shows that an important sphere of cooperation among the fraternal countries are the branches that are directly related to the sphere of private consumption--the production of industrial consumer goods and the agro-industrial sphere. It is noted that despite the successes that have been achieved in recent years in the development of Soviet light industry, the demand for many consumer goods is not being fully satisfied. This explains the fact that the USSR, where a much larger quantity of consumer goods is produced in a sufficiently broad assortment, enters the market of the CEMA countries as a netto-importer. It accounts for 56 percent of all the imports of consumer goods in the CEMA countries and only 9-10 percent of the total exports of these goods (p 229).

In the model of cooperation between the USSR and the CEMA countries that has taken form in the production of consumer goods our country plays the role of the main supplier of raw material (cotton) and in recent years also machines and equipment for light industry, durable goods (watches, refrigerators, television sets, cameras) and at the same the largest importer of prepared items of light industry (p 234). It is noted that problems in providing the light industry of the CEMA countries with raw materials, processed materials and modern equipment are being exacerbated and measures are presented for overcoming them. It should be added to this that in recent years the CEMA countries have been reducing exports of consumer goods, including to our country. This is shown by the reduction of the proportion of consumer goods in the overall commodity turnover of the CEMA countries. In 1980 it had decreased as compared to 1970 in Bulgaria from 14.7 to 8.8 percent, Hungary--from 21.3 to 18 percent, the GDR--from 20 to 14.8 percent, Romania--from 18.1 to 15.4 percent, and Czechoslovakia--from 16.6 to 15.9 percent.*

It is noted in the book that the deepening of cooperation in the area of production and trade in industrial consumer goods should be promoted by an appropriate long-term special-purpose program. But the scope of cooperation envisioned in this program does not fully correspond to the capabilities and demands of the CEMA countries. Therefore at the 35th CEMA Session they raised the question of the need for deepening cooperation among our countries in this

*"Statisticheskii yezhegodnik stran-chlenov SEV" [Statistical Annual of the CEMA Countries], Moscow, 1981, pp 337, 339.

area and augmenting the program with a number of new measures, especially for specialization and cooperation in production.

Using a large amount of factual material the book considers the cooperation between the USSR and the CEMA countries in the agro-industrial sphere and shows the role of the USSR as the largest importer and exporter of products of the main branches of the agro-industrial complex. The USSR stably provides for a considerable proportion of the import needs of the CEMA countries for grain (also being a large netto-importer of this product), vegetable oil, fish, cotton and several other goods (p 248). In turn, it is the main traditional importer of food products from the CEMA countries. During the past five-year plan these countries provided for 55 percent of Soviet imports of meat, 70 percent of the fresh vegetables, more than 40 percent of the fresh fruits and 90 percent of the canned vegetables (p 249).

Additionally, it is noted in the book that the traditional approach is no longer adequate for further development of cooperation in the agro-industrial sphere. It does not provide for the proper coordination of efforts throughout the entire cycle of reproduction in each branch of the national agro-industrial complexes. An important step in further development of cooperation in this sphere was the adoption of the long-term special-purpose program for food. But, while describing this program one should say that problems arose during the implementation of the measures earmarked in it. In order to overcome them the 35th CEMA Session adopted a decision to augment and deepen cooperation in the agro-industrial sphere. This will contribute to increasing the supply of CEMA countries with agricultural products and will reduce expenditures on importing foodstuffs from other countries.

The work contains interesting extensive material about the participation of USSR transportation and providing economic ties between our country and the CEMA countries. The center of gravity in the solution to the transportation problems under the conditions of deepening socialist economic integration lies in practical implementation of the special-purpose program for the development of transportation ties. The program envisions a complex of measures for renovation and creation of new transportation systems in the directions of east-west and north-south, and also renovation and expansion of the system of railways between the USSR and the European socialist countries.

One of the problems that pervades the entire book is the development and improvement of scientific and technical cooperation between the USSR and other CEMA countries. In presenting the materials they give an evaluation of the past stage of cooperation in this area and disclose the content of its present stage. They investigate the forms and methods of interaction among the CEMA countries in the sphere of scientific and technical cooperation and give numerous examples of its results. Still it is noted that, in spite of the enlistment of significant scientific forces and material resources into this sphere and the large volume of joint scientific research and planning and design work, the results that are achieved do not always correspond to the demands that are made. Thus we are not sufficiently introducing advanced technical decisions, models of new technical equipment, or equipment and instruments at the level of world standards. A successful solution to the complex problems

of the scientific and technical revolution can be provided through extensive cooperation of several countries with the active participation of the USSR in it (p 309). But on the whole the analysis of the factors causing problems in the sphere of scientific and technical cooperation is not given sufficient attention, in our opinion. For a more complete disclosure of these problems and ways of surmounting them one should make more extensive use of the materials of the sessions and other CEMA documents.

The book under review has a chapter which at first glance seems to be outside the main focus of the research. But with a more careful familiarization with the work it becomes clear that it is expedient to include this chapter in the book. We are speaking about the criticism of the bourgeois concept of the position of the USSR in the socialist community. Drawing on weighty arguments and facts, the authors convincingly refute the assertion of bourgeois critics concerning USSR hegemony in socialist competition and the USSR's imposition on the CEMA countries of the "Soviet model" of administration of the economy, and about the poor effectiveness of the entire system of mutual economic ties among the CEMA countries, since it is based on planned principles and free of random market elements.

On the whole the reader has received a comprehensive investigation which, in spite of individual shortcomings, introduces the main problems of economic cooperation between the USSR and the fraternal countries of socialism and discloses our country's decisive role in the development and deepening of socialist economic integration.

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CSO: 1820/129

BOOK ON FOREIGN DEVELOPMENTS IN CONSTRUCTION INDUSTRY REVIEWED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHEL'NOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 186-192

[Review by S. M. Finkel', Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk) of the Book "Tendentsii stroitel'stva v vedushchikh kapitalisticheskikh stranakh. Faktory effektivnosti, problemy i protivorechiya" [Tendencies in Construction in the Leading Capitalist Countries. Factors in Effectiveness and Problems and Contradictions), ed. by Ya. A. Rekitar, doctor of economic sciences, Moscow, "Nauka", 1981. Authors: D. B. Baranov, V. B. Kondrat'yev, M. N. Romashina, et. al.]

[Text] The collective monograph being reviewed is devoted to capital construction as a branch of material production, to an analysis of the effectiveness and the directions of technical progress in the various stages of the creation of the construction product, and to new phenomena in the development of construction in the United States, Japan, the FRG and France.

Construction in capitalist countries is carried out mainly by the contract method: in the United States it comprises approximately 80 percent, in Great Britain--about 88 percent, the FRG--more than 60 percent and France and Japan--84 percent of the overall volume of construction work. The contracts include conditions for paying the contractor a guaranteed reserve upon the expiration of the guarantee period of responsibility of the designers and builders for the quality of the work.

The authors of the monograph have analyzed in detail the reproduction, technological and branch structure of investments in the leading capitalist countries of the modern stage. The past 30 years are characterized by more rapid growth of the active part of capital investments, as a result of which the average annual rate of increase in volumes of general construction work were less than the increase in gross capital investments in the economy. During the period under consideration in the United States, Japan, the FRG and France the proportion of expenditures on machines and equipment in the gross investments increased from 45-67 percent to 65-80 percent.

The reproduction and branch structure of construction has been subject to significant fluctuations. Scientific and technical progress have accelerated the

obsolescence of means of labor in all spheres of material production. The supply of buildings and structures accumulated during the first half of the 1950's because of the formation of new branches has created conditions for more rapid growth of the active part of fixed capital. Work for reconstruction has become one of the essential factors in production growth.

Considering the tendency of the change in the productivity and capital availability for labor and construction, the authors of the book have shown that construction is not adequately provided with fixed capital. With a high level of manual labor this branch is significantly behind industry in terms of the level of capital availability. On the other hand, the increase in this indicator was not accompanied by a corresponding increase in the rates of growth of labor productivity, which in 1960-1980 significantly lagged behind the growth of capital availability in the countries under consideration.

Since the beginning of the 1960's, while there were considerable differences in the branch structure of material resources, there is a growth of the proportional material-intensiveness of construction output. The output of effective materials and designs has taken place more rapidly than the volumes of construction and installation work.

The monograph considers tendencies in the development of production of progressive kinds of construction materials and elements. The authors have analyzed factors that determine the structure of construction materials and elements. They include the interchangeability of items, the division of labor between construction and its material and technical base, new physical and mechanical requirements on construction materials, and the suitability of materials for industrial construction technology. The higher price of the labor force in construction and installation work as compared to that at the plant makes it necessary to turn to construction elements with complete plant readiness and to reduce labor expenditures at the construction site to a minimum. The long-range tendency of more rapid increase in the price of the labor force as compared to the prices of industrial goods also forces the entrepreneurs to be oriented toward elements that are less labor-intensive for installation. Special attention is attached to reducing the weight of construction materials and elements and increasing their quality and durability.

But, it is noted in the book, in the capitalist economy the structure of production and consumption of construction materials is subject to random change. The production of construction materials and elements experience something like a dual influence of crisis shocks and disproportions in the national economy.

On the basis of extensive factual material the monograph gives a detailed survey of the utilization of a large group of construction materials and elements in capitalist countries. Thus in order to develop the cement industry the majority of foreign countries typically have a prevalence of Portland cement: in the United States--98.2 percent, Japan--93.6 percent, France--86.6 percent and the FRG--78 percent. The production of quick setting Portland cements is increasing.

In capitalist countries elements made of cast-in-situ concrete and reinforced concrete are prevalent. The proportion of prefabricated elements, according to the authors' estimates is in the range of 10-12 percent. It would seem that this tendency contradicts the desire to reduce labor expenditures at the construction site. But when considering the development of construction on the basis of cast-in-situ concrete in the past 15-20 years, the authors note the high degree of mechanization and organization of construction production, which provides a basis for considering cast-in-situ construction to be industrial and not traditional technology.

According to the estimate of some West German researchers, the application of cast-in-situ concrete in multistory construction is 10-15 percent less expensive than precast concrete and reinforced concrete, which is explained by the not unquestionable advantages of the former method and shortcomings in construction because of precast reinforced concrete whose elimination leads to a prevalence of the latter. Preference in production has been given to the development of precast reinforced concrete because of the of the prestressed elements on the basis of highly durable cements and fittings made of steel with increased durability.

The improvement of prefabricated elements is proceeding in the direction of making them lighter. Lightweight polymer fillers are being used extensively. Elements made of polymer concrete have increased corrosion resistance, density and durability, but so far they are twice as expensive as ordinary concrete. In the construction of structures with few stories it is effective to apply lightweight concrete hollow block with inserted polystyrol foam. The authors emphasize the reduction of the level of expenditures by 25-30 percent as compared to other kinds of local wall materials.

The practice of reinforcing concrete with propylene asbestos fiber and fiberglass, and also the application of construction items that are based on progressive kinds and profiles of metal, plastic and plywood is interesting.

In the United States metal construction elements are one of the most important construction resources. Even now they are extensively utilizing elements made of sheet metal with a thickness of 6.35 millimeters and less. According to the authors' estimates, the application of thin sheet steel provides for a 30-50 percent savings as compared to traditional steel elements. Technical progress here consists in further reducing the weight of the elements and utilizing thin sheet steel and effective profiles for manufacturing them, and also producing prefabricated metal buildings to be delivered in sets. It would be interesting to analyze the durability characteristics of the steels that are used and planned for metal elements.

In all stages of construction aluminum and aluminum alloys play a large role. In the United States, for example, the volume of its utilization at construction sites in 1972 reached 1.36 million tons, and 39 percent went for elements of thin sheet metal. But by 1975 the consumption of aluminum elements in construction decreased by 22.6 percent as compared to the preceding year. It is surprising that there was a considerable reduction in the volumes of production of enclosing structures. Both in this monograph and in other books

devoted to foreign practice,* one encounters the assertion that the utilization of aluminum is more effective for mounted enclosing elements. But, referring to the opinion of foreign specialists, the authors assume that in the future aluminum elements will be extensively applied both as decorations and as mounted wall panels, suspended ceilings, cornices and so forth. In these elements aluminum can compete successfully with steel.

In construction practice many foreign countries are extensively using plywood structures which have valuable properties: resistance to various aggressive environments, simplicity and speed of installation and architectural expressiveness.

Extensive utilization of effective polymer construction materials and elements is an important factor in technical progress in the branch. Construction in the developed capitalist countries is the largest consumer of synthetic raw material. The proportion of plastics consumed in construction has reached 20-25 percent of the overall volume of their output. The book gives the following comparisons: a ton of polymer raw material saves 40-50 man-days of labor expenditures, 5-6 cubic meters of valuable kinds of timber and 1.2-1.5 tons of metal. Plastic facings based on the polyvinylchloride instead of aluminum ones are successfully used in the United States when modernizing and renovating residential buildings. In the long-range future it is intended to increase the utilization of plastics as construction materials, and also in panels, roofs and other construction elements in combination with wood, cement and metal. Further improvement of construction plastics involves increasing the strength, durability and fire resistance.

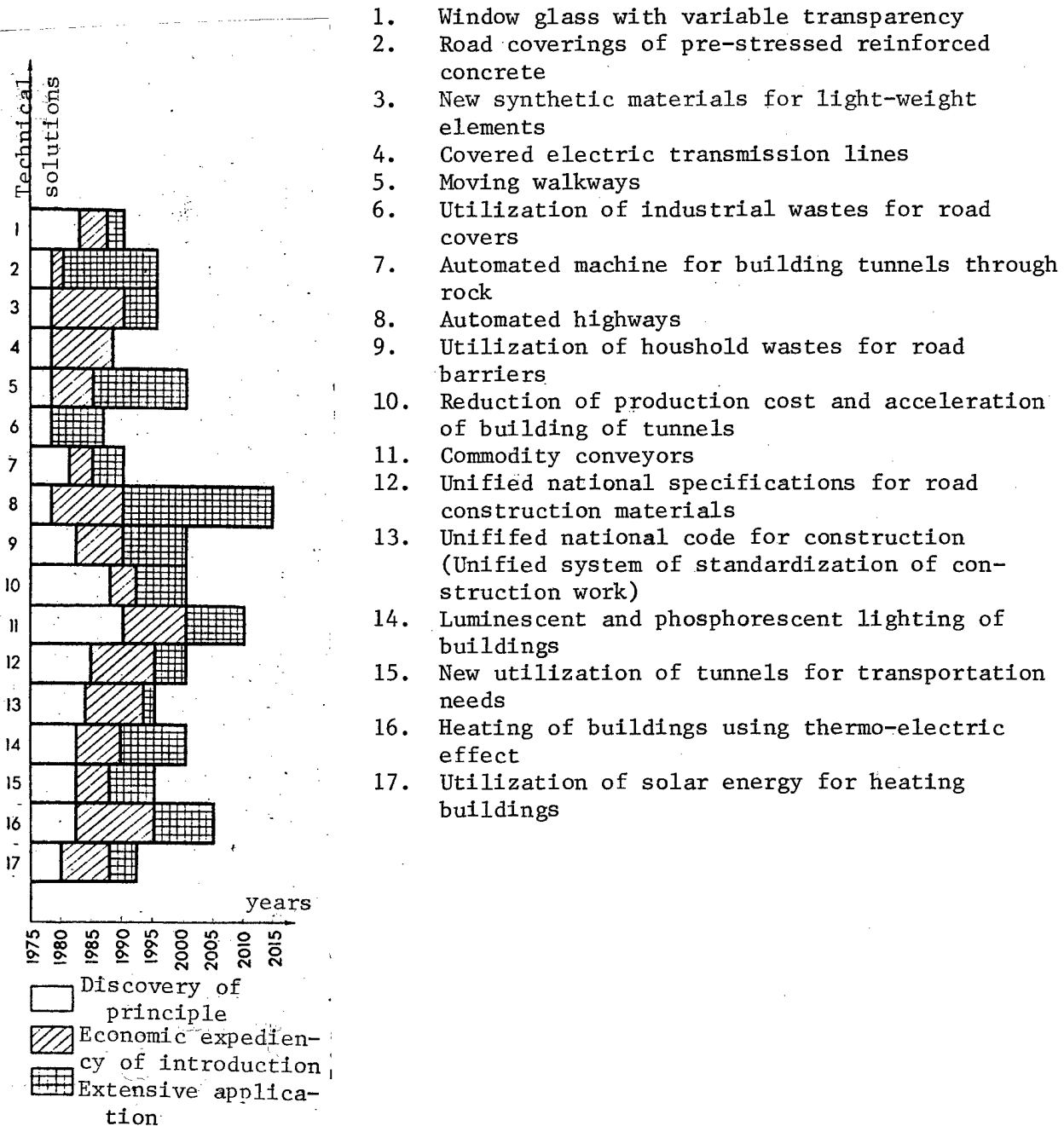
The book elucidates in detail the condition and prospects of the production of construction materials on the basis of industrial wastes. This is a very crucial issue. The solution to the problem of salvaging industrial and household wastes is extremely important for maintaining the environment, and for reducing material-intensiveness, capital-intensiveness and production outlays.

The monograph discussed extensively the foreign experience in the utilization of construction machines and mechanisms. The authors note the high level of concentration in the production of construction equipment. The growth rates of the output of these products exceed the average rates for the processing industry. The proportion of exports in the branch is very high: the United States--34 percent, the FRG--68 percent, and England--54 percent. In all of these countries there was an increase in the proportion of construction machines with wheeled chassis (the United States, Japan), and pneumatic drive (the FRG). The equipment that is produced is characterized by a high technical level. Expenditures on NIOKR in American firms that produce construction equipment amount to about 3 percent of the volume of annual deliveries of their product.

One of the most important reserves for reducing expenditures of manual labor and increasing productivity is the utilization of means of minor mechanization. The output of mechanized instruments, whose application makes it possible to considerably reduce manual labor in construction and installation

*See, for example, Bobrova, K. N. and Zezin, V. G., "Ekonomicheskaya effektivnost' legkikh ograždayushchikh konstruktsiy" [The Economic Effectiveness of Lightweight Enclosing Elements], Moscow, Stroyizdat, 1976, pp 14-15.

Figure. Prediction of Directions of Technical Progress in U. S. Construction



work, is developing at rapid rates. The United States, for example, produces about 12 million units of various kinds of mechanized instruments, which consist mainly of electrical (64.9 percent) and pneumatic instruments (33.9 percent).

Further development of construction equipment is proceeding along the path of increased unit capacity of machines and extensive utilization of hydraulic systems, automated control systems and universal construction equipment. Scientific research work is being conducted on the application in construction of aircraft, laser beams and robots.

Industrialization of construction mechanisms makes it possible to reduce the time periods for construction. A great deal of significance is attached to maximally combining in time individual elements of the investment cycle: science--technical planning--construction--startup of new capacities.

The monograph ends with recommendations on the utilization of positive elements of foreign experience in the Soviet economy. It demonstrates the effectiveness of individual planning of the construction and technological parts of industrial building, which provides freedom for modernization of production. In the area of the application of construction materials and designs it is expedient to raise the level of plant readiness, to lighten bearing and enclosing elements and to apply in enclosing elements of buildings "for light" applied panels with facings made of aluminum or aluminum alloys, asbestos cement or plastic, which has effective fillers. In the future plastics and synthetic resins will be effective as construction materials and also in combination with traditional materials.

On the whole the monograph is a useful investigation of new phenomena in construction in capitalist countries. This is the most complete comprehensive investigation of this subject.

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CSO: 1820/129

MISUSE OF 'COEFFICIENT OF WORKER PARTICIPATION' [KTU] INDEX RECOUNTED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 193-196

[Article by B. P. Kuttyrev: "And the Pocket Money--Separate"]

[Text] With great difficulty I managed to force my way into a meeting of the brigade where they were distributing the additional collective earnings and bonuses according to the KTU (coefficient of labor participation). It was necessary to turn for help first to the master and then to the shop chief, and finally to the secretary of the plant party committee. Through joint efforts they convinced the brigade leader Ostanin. But he made a stipulation: that I would sit quietly and not speak or give advice

We agreed to this.

And in order that an outsider would not draw attention to himself, I was accompanied by several of "their own"--the section master, the section chief and the head of the shop party organization.

Why was it necessary to expend so much effort in order to attend a meeting of the brigade? Would it not have been simpler to find out what happened at it from the plant workers themselves? But it is better to see once than to hear seven times how the mechanism for distribution according to the KTU actually operates, to what extent it contributes to the formation of a collectivist socio-psychological climate among workers who have selected the brigade form of organization and stimulation of labor. And after all it is soon to become the main one! The creation of a collectivist moral and psychological climate is one of the important goals when creating brigades and extending the application of this form. Unfortunately, the methods applied when distributing brigade wide earnings do not always correspond to the implementation of this task, and sometimes lead to negative results, including the breakdown of the brigade and increased dissatisfaction with this progressive form of organization and payment for labor. It is generally recognized that the methods for distribution according to the KTU require scientific substantiation and improvement.

But why was the brigade leader against having a "stranger" attend the meeting? It seems that there are several reasons for this. In the first place, the

earnings are an internal matter of the collective and they can handle this matter better without outsiders. And if there is dirty laundry here, it is better to keep it at home. In the second place, many workers understand quite well how imperfect the methods of distribution according to the KTU which they propose are. Therefore it sometimes happens that the plant has formally declared one set of methods, but actually applies another set that is more acceptable. Avoiding the recommended method, the workers, naturally, are afraid that this can cause complications with the administration.

Then why did the brigade leader Ostanin still agree to the presence of an "outsider"? I assume that he was not uninterested in knowing the opinion of "science," for it is no longer a simple matter for the leader to control the brigade, and the difficulties are growing. With the introduction of brigade organization, the style of management and the relations among people change. While previously it was easier to judge and punish a worker who had not followed the instructions of the manager, today it is much more difficult to do this within the brigade. Moreover the brigade leader was confident that the presence of an outside person would not hamper the procedure being followed in the meeting and would involve no practical conclusions.

And so I sat in the corner trying not to draw attention to myself, and I did not even take any notes; I relied on my memory. The brigade meeting had only one item on the agenda: how to distribute payments according to the KTU?

Assignment

Here are some initial data. All members of the brigade of machine tool workers of the mechanics shop M-3 were present at the meeting -- eight people, and the ninth was a student at the vocational and technical school, Ivanov (8),* who had worked with them all month. Varyanov (3) is considered to be his tutor. When the brigade was created they tried to select workers with the same job characteristics -- so that it would be easier to "divide." Only the worker Bogdan (2) was in the third category and Zhilkin (7), the fourth, and all the rest were in the fifth. Nonetheless they all ended up with equipment of different ages -- each with its quirks. Only one worker, Golovko (4) would operate any of them without objections. He performed all assignments equally well. All the rest of them were drawn to their own machine tools, kept track of their own instruments, even swiped them from others, and they argued about "advantageous" work, even though there were no individual ratings in effect, and they were unwilling to combine occupations.

When Golovko could not help or there were too many trouble spots for one person, the master of all trades was the brigade leader Ostanin (9). The collective had no cause for shame about poor discipline. Only the worker Dvalishvili (5), ardent and impetuous, but not responsive, failed to show up for work one day. On the next day he gave the excuse that someone from his native district had come to visit him. Nobody reproached him, but when it was necessary to remain after work and take a shift at the request of the shop chief, it was

*In the parentheses are the numbers of the members of the brigade from the table which is given in the answer.

Dvalishvili who was first to be sent. Additionally, Amosov had a rejected piece of work, which was discovered only during assembly, and the assembly workers made a justified complaint against the brigade. It was also necessary to take into account that Yelevskiy (6) participated for 3 days in the city football competitions. On Sunday, true, he did not have to work.

The occupational group organizer Zhilkin was made responsible for figuring out which coefficient should be used for whom. The sum for distribution according to the KTU was 720 rubles or, if all were equal, --80 rubles each. The overall initial number of points was 9. The student of the vocational and technical school Ivanov was included on the brigade staff list. The fact is that according to the normatives, the brigade should have 12 people. For working with fewer people part of the earnings of the released worker are paid. By a decision of the administration, the least number of workers the brigade could have was nine. If the brigade fulfilled the assignment with eight, the initial normative for it would be 11. Therefore Ivanov became the ninth.

Zhilkin gave the following coefficients: Ivanov -- 0.5, because this is the coefficient we give to newcomers; Varyanov -- 1.2, 0.2 points were added for tutorship; Golovko -- 1.4, 0.2 for helping others and 0.2 for combining occupations; 0.1 was removed from Bogdan for his category and 0.2 from Zhilkin for his category, but 0.1 was added for performing public duties; each will receive 0.9 points; the same amount was given to Yelevskiy because he did not work with the others for 3 days; 0.2 were taken from Amosov for the rejected work which was not rectified in the brigade; 0.3 points were taken from Dvalishvili for his failure to appear at work. The coefficient of labor participation of the brigade leader will be 1.7 points. The total is 9 points.

The first to object was Dvalishvili (because he made up for his absence and then some) and Yelevskiy, who was always being congratulated and was proud of being the forward of the plant team, and now his coefficient was being decreased. Ivanov sat calmly, and the others accepted the reduction of their coefficients in silence. True, Amosov whispered to his neighbor, that his rejected work was not at all his fault, but he did not announce this out loud. The brigade leader, understandably, was satisfied with the distribution. The addition to his wage rate was 136 rubles, while for Ivanov it was -- 40, Varyanov -- 96, Bogdan -- 72, Zhilkin -- 72, Golovko -- 112, Dvalishvili -- 56, Amosov -- 64, Yelevskiy -- 72 rubles. Each calculated his additional earnings and those of the others, they had a little conversation, and then they left.

There were five of us left -- the brigade leader, the master, the shop chief, the shop occupational organizer and myself -- to judge the mistakes that were made in the distribution. And this will be the assignment: what mistakes were made at the meeting? What action would have been more correct?

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QUESTIONS OF RETURNING REFORMED ALCOHOLIC WORKERS TO FORMER POSITIONS

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 197-198

[Article: "How to Return?"]

[Text] Questions

1. In keeping with the Ukase of the Presidium of the RSFSR Supreme Soviet, "On Compulsory Therapy and Labor Re-education of Chronic Alcoholic," of 1 March 1974, by a decision of the court citizens can be sent to therapeutic labor clinics (LTP) for compulsory therapy. The court examines the case on the initiative of the administration after the collective has exhausted its possibilities of influence. Under what conditions does the court make these decisions?
2. At enterprises, unfortunately, there are cases where individual workers end up in the sobering up tank 2 or 3 times a year. What administrative measures can be taken against them?
3. The worker is sent to a therapeutic labor clinic by a court decree. What happens to the labor contract?
4. Judging from the name of the institution, a person who is sent to an LTP is treated there and also works there. How is his vacation established?
5. A person has returned from a therapeutic labor clinic. Where is he placed in a job?
6. Those who have come from a therapeutic labor clinic are not always willingly accepted at their former job. Who is responsible for placing them in a job?
7. According to the rules for calculating continuous labor tenure of workers and employees, when granting stipends for state social security (established by a decree of the USSR Council of Ministers of 13 April 1973), the time spent in a therapeutic labor clinic does not interrupt the labor tenure. In which cases is it not included in the labor tenure?
8. How does one calculate the tenure that gives one the right to receive benefits established for workers in regions of the Far North and localities on an equal footing with them if the worker has been sent to an LTP?

9. The worker Valetov arrived at a construction site under an emergency labor contract. Within a year and a half, by a decree of the court, he was sent to an LTP. If after he returns he begins to work again in the same place under the emergency labor contract, how is his tenure calculated.

10. A person who has been sent for treatment of alcoholism has carried out all medical instructions conscientiously and with conviction, he does not violate conditions, he works conscientiously and fulfills production assignments. Can he be released from the LTP ahead of schedule?

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CSO: 1820/129

PRODUCTIVE-ECONOMIC, MORAL-PSYCHOLOGICAL DIMENSIONS OF MANAGERIAL DECISION MAKING CONTRASTED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 202-214

[Article by Yu. D. Krasovskiy, candidate of philosophical sciences, Institute of Administration imeni S. Ordzhonikidze (Moscow): "The Manager Makes a Decision . . ."]

[Text] When making one decision or another the manager always has in mind a dual effect: production-economic and moral-psychological. And the evaluation of the decision he has made will be not only the economic indicators, but also the behavior of the workers when they have achieved the production goals, the measure of their activity, initiative and collectivism.

Are Subordinates Guilty?

The responsibility of the manager increases when he has to make risky decisions. It increases even more if the decision is made unilaterally and on the spot. The greater the responsibility, the more justified the risk should be. And this is possible only when the decision is developed taking into account the opinions of all of those who will have to implement it.

A decision made unilaterally, on the one hand, increases the responsibility of the manager, but, on the other, it places him in a position of personal responsibility for possible errors. This contradiction is aggravated when the mistakes are revealed in the stage of implementation and finalization. It seems that he has approached a problem situation responsibly ("I did everything I could"), but objectively it turns out that the decision was not well enough considered -- for there were mistakes! Frequently the manager does not see where and when he made the errors, and therefore he either blames everything on the circumstances, or -- on his subordinates.

But most frequently it turns out that the manager himself is guilty: he does not take into account the fact that the workers react not only to how correct his decision is, but also to the degree to which he takes their opinion into account and values their ability to cooperate. Therefore the "cost" of a mistake is paid not only in economic losses, but also in psychological trauma (conflicts), moral and pedagogical errors (indifference toward work) and disorganizing factors (discharges, idle time, and rush work).

Let us consider a concrete example.

Data about the volumes of construction and installation work arrived at the supply division of the main production administration from the planning division a month and a half late. Thus the normal procedure for calculating the needs of each production association for material resources was violated. In the division the situation was tense. The chief of the main board pressured the chief of the supply division. The latter justified himself, but at the same time demanded that the workers work more rapidly, without improving the organization of the work. As a result of the haste, one of the workers made a mistake -- he did not take into account the introduction of three residential buildings and therefore failed to plan for 20,000 square meters of linoleum for them. This mistake went unnoticed since the work was not checked either by the chief of the supply division, or by the higher planning organization or by the lower production organization. In the end the plant delivered less linoleum than was needed. The time came to lay the floors and the management of the construction and installation administration submitted an order to the trust to issue the linoleum from the warehouse. But in the trust, after checking the orders and the plan, they discovered that the quantity of linoleum was not planned. There was no reserve in the warehouse, and the building was not released on schedule. As a result, the builders and the management of the trust's construction and installation administration ended up without a bonus. In the main board they began to figure out the situation, they found the reason, and they reprimanded the chief of the supply division who, in turn, gave a severe reprimand to the worker who had made the mistake in his haste.

The cost of the mistake turned out to be great: it affected production organizations of various levels. And although it was made by a rank-and-file worker, the real reason for it was the inability of the managers to organize the work.

From this example it is clear how fear of failure to meet the demands "from above" has distorted the managers' responsibility for observance of the normal labor rhythm of their workers. When reporting fulfillment of an assignment on time becomes the main thing for the managers, concern for the people who actually do the work is pushed to the side of their awareness.

To Aim at the Workers or the Management?

As we know, in the "vertical" administrative interaction a great deal is decided by the personal relations of the lower manager and the higher one. If the higher chief has authority and never goes beyond his personal responsibility, the lower manager exerts effort to handle the matter entrusted to him. He tries to avoid conflicts with his subordinates and arranges his relations with them in such a way that they have a desire to fulfill the assignment within the established deadlines. And this means that the manager tries to foresee the psychological-production situation and creates in his mind an optimal model of administrative interaction. He predicts future events, counting on success. And it is this that compensates for the negative emotions related to fear about the fulfillment of the assignment. The prediction of efficient behavior of the workers is built on a positive emotional basis; the anticipation of success suppresses the fear of risk.

But if the higher manager does not use his authority well and is inclined to shift the blame to his subordinates, the lower manager is in danger of ending up "guilty without having done anything," since he can expect abuse from his boss for any reason, including mistakes of which he is not guilty. As a result, he is less bothered about fulfilling the assignment he has received, not to mention the microclimate in his collective. Since the threat to his personal well-being hangs over him like Damocles' sword, he is prepared to fulfill the assignment even at the price of conflicts with his subordinates, if only he does not end up in the role of the victim of the abuse. In his mind the prediction of the work behavior of the workers is replaced by the prediction of the behavior of the management. This replacement takes place on a negative emotional basis. While in the former case the leading motive for the action of the manager was the desire to justify the confidence of the boss and perform the assignment well, in the latter case it was a desire to avoid a compromising situation and report the fulfillment no matter what, and best of all -- ahead of schedule.

Controlling the Behavior of the Workers Means Primarily Controlling One's Own Behavior

The experienced manager listens attentively to all viewpoints of his subordinates, agreeing with the general position and developing his own point of view along the same lines. The workers are satisfied with the fact that their opinion lies at the basis of the decision and are gratified by the fact that they have rendered assistance to the manager. With such an alignment of forces the responsibility of the manager is reinforced by the moral responsibility of his subordinates.

But here is the opposite situation; the manager makes a decision without consulting his co-workers or without explaining his motives to his subordinates. And although this is legally justified (he bears full administrative responsibility for the correctness of the decisions that are made), the moral and psychological effect of this behavior most frequently turns out to be negative. For the workers are offended because they are regarded as "small fry," and they do not even want to pay any attention, not to mention implementing the decisions, the motives for which are unknown to them. People gradually become accustomed to simply following orders, and they think that it is not their affair to participate in the solutions to production problems. This kind of management forms and reinforces a certain stereotype in thinking: "Our business is trivial; let the management think for us." This stereotype has a truly tragic side: the workers can perform the work knowing (!) that it will lead to the wrong results.

It is bad when a manager, out of pride, fails to take into account the opinion of his subordinates, who warn him about the possible negative consequences of a decision he has already made. And if he does this openly, the administrative interaction is completely violated and a situation of conflict arises.

This variant is also widespread: the manager prefers to make a decision alone, and only later explains his reasons to his subordinates. The moral and psychological effect of such an administrative decision can turn out to be

insignificant. The workers, although they know why the manager acted in precisely this way, perceive this decision as being imposed on them from outside and judge it critically, even if it is actually successful, and they carry it out with reservations, irony and indifference. And if the manager has been mistaken in any way they are satisfied with this, as a confirmation of the "correctness" of the subordinates. And some of them even wait for the manager to make a mistake in order to have a chance to demonstrate their viewpoint and thus satisfy their desire to influence decision making. In this case there is no longer any unity of action of the manager and his subordinates, and skepticism about the decisions of the manager personally is transferred to the work itself.

It also happens that the manager listens to the opinions of his subordinates only in order to refute them and thus demonstrate his competence. This hardly increases the collective's interest in the forthcoming work. The reaction can be this: "It does not make any difference, for he will not be convinced. Well, in the end he is responsible for the decision and not us. Let us do what they want, and whatever happens, let the management figure it out" You see-- again indifference, again a reason to work without enthusiasm.

In any case, when making a decision a manager should sense a problem situation, especially if his subordinates wish to resolve this situation. It is important to give them the opportunity to realize themselves and to support their initiative. It would hardly be correct to consult only with a limited group of people when others are also ready to participate in solving the problem. And a situation where the chief openly consults only with one of the workers (even an intelligent and sensible one) is quite inadmissible. This happens most frequently in those subdivisions which are not directly included in the production cycle (divisions, bureaus, services and laboratories). Thus in one of the institutes we encountered a situation where the laboratory chief when making a decision began to give clear preference to the advice of one of the workers. And he constantly juxtaposed his suggestions to those of the others. While previously this co-worker did not participate actively in the development of decisions, now here initiative clearly began to prevail over the proposals of the others. Sensing the favorable disposition of the boss, she allowed herself to take a condescending and critical attitude toward her work comrades. In the laboratory collective which was previously healthy, there quite frequently appeared, on the one hand, attitudes of "favoritism" and, on the other, a hostile attitude both toward the boss and toward the favorite. The initiative of the co-workers dropped sharply and the work became burdensome. Minor conflicts, accumulating, led to a sad result: the workers began to quit, and the ones who remained were forced to do the previous volume of work and, of course, they did not always manage to do it on time. Frequently, deprived of bonuses, the workers began to oppose the manager. The moral and psychological climate in the laboratory deteriorated to such a degree that it was necessary to have administrative intervention from above.

Sometimes the manager overestimates his capabilities, in spite of warnings from the collective. Burning with the desire to show the management what he

is capable of, he takes on himself (and on his subdivision) clearly impossible commitments. And this alienates him from his subordinates. Inexperienced young managers typically overestimate their capabilities. At the same time this is a frequent phenomenon among those who have boldly taken on the responsibility for the fulfillment of complicated assignments but do not carry them out because of their inability to organize the collectives.

Thus there is only one possible way of providing psychological support for any administrative decision: through sincere respect for the opinion of the collective and the internal readiness of the manager to take this opinion into account.

The most important decisions are made, as we know, with the agreement of the party, trade-union and Komsomol agencies and agencies of public self-government. The responsibility of the manager for adopting these decisions consists in taking all opinions into account as completely as possible.

Limitations

The selection of any administrative decision is always limited. This is explained by the need to adhere to certain behavior norms, which also orient the manager. Depending on the situation, the manager selects the variant of administrative action ("I am obligated to act in this way and in no other" . . . "I should act in this way although I am not obligated to" . . . "I am forced to act in this way although I should not . . .").

The requirements of certain norms contradict one another and therefore the manager weighs the various combinations of them. In his consciousness each time he resolves contradictions ("I want to, but I should not"; "I can, but I will not do this"; "I will help, although it is not necessary"; "I want to, but I am not obligated to" and so forth). Any decision that is not primitive and obvious is made in the form of this kind of internal dialogue and debate, which are sometimes very heated and exhausting. The morality and human honesty of the manager play an immense role here.

The internal debate with oneself which we mentioned above is an ordinary phenomenon, especially when the manager's rights are less than his responsibilities. This means that life requires that he do more than he is formally required to do, and here he is sometimes limited by his rights. Psychologically, this lack of agreement between rights and responsibilities leads either to increased economic enterprisingness, which is frequently manifested in a distorted way (avoidance of responsibility, an inclination to take chances, libertarianism), or it instills passiveness and leads to administrative indifference.

An important point which the manager passes when making a decision is the evaluation of the possible consequences. In the final analysis the selection depends on the information about the consequences which the manager has at his disposal. If it is minimal or contradictory the decision, as a rule, is emotional and arbitrary ("I do not know how the workers will react to my decision, but I will order them to act precisely in this way"). If the information is more or less complete and is not contradictory, the selection of a decision has a rational basis.

The manager's freedom of choice depends on the significance he attaches to those normative limitations which are imposed on him. When organizing work he can give priority to moral goals, being concerned about the education of the workers, but he can base the assignment on a purely business intent, striving only for its fulfillment, even if this is fraught with moral costs.

Let us take one more situation which, in the opinion of many managers who participated in our discussions, is typical.

Who Is Guilty?

. . . For a half a day the loaders of one of the shops have stood idle -- there was nothing to unload. Within 10 minutes before the end of the work day two trucks finally arrived, loaded with getinax sheet foil. It had to be dispatched immediately since the trucks were scheduled to be elsewhere.

Master Lomov, addressing the workers: -- "Unload it!"

The workers: -- "Working overtime again?! Let whoever wants it unload it . . ."

Master: -- "There is nothing to talk about! The trucks have to be dispatched!"

The brigade leader, hesitating: -- "It has to be unloaded, boys . . ."

Workers: -- "Then pay us for overtime at 20 rubles!"

The worker Kryuchkov (an experienced worker with authority and 40 years): -- "We are tired of staying after work every other day! And we sat for a half a day with nothing to do. You cannot organize the work, and we take the rap. You should pay! And if you do not want to pay, bring it in on time and we will unload it."

Master Lomov, irritated, addressing the brigade leader: -- "What kind of a brigade do you have here? Who is the brigade leader? You cannot organize the work! . . ."

Only two of the seven people support the brigade leader, but they do not hurry with the unloading. The rest of them head for home. Then the master hurries to the shop chief and explains the situation to him.

The shop chief, without going into details: "What good does it do to talk about it?! The trucks have to be dispatched and your people went home. Can't you organize them?!"

Master: -- "You yourself must organize the shipments on time! The people sat around for a half a day with nothing to do!"

Shop chief: -- "That is none of your business! Call the brigade!"

The brigade comes. Kryuchkov speaks on their behalf, demanding overtime pay.

Shop chief: -- "I will not pay that! You have sat around for a half a day and you are not tired. Unload it!"

Kryuchkov: -- "Go home, boys."

The shop chief to Kryuchkov: -- "And so you are leading the people to rebellion? But remember your own bad behavior, remember your drinking bouts? We did not bother you. And then you act like this? I will fire you and enter your name in the labor book!"

The brigade, embittered, goes home. It is necessary to find someone immediately to unload the trucks.

The shop chief to the master: -- "Get yourself out of this mess however you will, but unload the trucks!"

The master goes to the neighboring shop where the second shift has already begun to work and comes to an agreement with the master of the other brigade, who sends several workers to unload the trucks. The workers are not specialists in loading and unloading work; moreover they do not have the necessary equipment. They hesitate. Then Master Lomov promises to pay them 15 rubles each. The brigade agrees and begins to unload both trucks quickly: for they have to do their own work as well. Master Lomov, having shown them where to put the getinax, goes home without waiting for the unloading to be completed.

On the next day when he comes to work he finds out that Kryuchkov and three other loaders have turned in their resignation. But it is necessary to document the assistance received yesterday from the neighboring shop. The master fills out a "fake" order for overtime unloading. But since the master's fund has already been exhausted and the shop has not envisioned payment for this kind of work (loading and unloading work has been done by the brigade with the time-rate form of payment and not piece-rate), the master turns for assistance to the shop chief. He has decided to consult with the chief of the division for labor and wages, Noskov, telling him everything that happened.

Noskov: -- "Yes, quite a situation. I sympathize, but I cannot help you at all. Go to the deputy director for economics."

The shop chief goes to the plant's deputy director for economics, Shishkarev.

Shishkarev, having listened: -- "How long did they work? An hour? That is 15 rubles each for eight of them? A lot of money! The guilty party should pay!"

The chief of the supply division is called in: -- "Why did you not get the getinax here on time?! How long can this go on? You will pay!"

The chief of the supply division: -- "But our service is not to blame. These were not ordered vehicles -- check with the dispatcher."

Shishkarev calls the dispatcher: -- "Yesterday some trucks loaded with getinax were late. When will you start working on schedule?"

Dispatcher: -- "The trucks were sent on time, but they stood idle for 3 hours in the warehouse; the fork life was not working . . ."

A call to the head of the warehouse: -- "Can't you keep your equipment in working order? The trucks were late again yesterday. You should have loaded them yourself, by hand!"

Warehouse chief: -- "But the technical equipment was in order. You understand, the inspector for technical safety discharged the rigger Sidorov; he did not pass training. . . ."

. . . At the end of the working day the deputy director for economic problems received a memo from the division for technical control which announced the large percentage of rejected products -- they had been manufactured from raw material that had been shipped in the day before. The memo announced that the damage to the foil sheets happened during unloading. The brigade that unloaded the getinax foil did it hastily, without special equipment. Nobody went over the instructions with them.

Shishkarev issues an order:

1. The unforeseen expenditures for unloading the getinax foil must be paid by the head of the warehouse -- 120 rubles (since he is responsible for prompt instruction on technical safety for all of the workers under his jurisdiction.
2. The cost of the rejected products will be withheld from the pay of Master Lomov (30 rubles).
3. The shop chief will be warned about the need for strict observance of financial discipline and order in loading and unloading work.

Master Lomov turns in his resignation. As a result, five people have left the shop within 2 weeks . . .

The deputy director for economics acted in a way that would appear to be correct by unraveling the bundle of violations and determining the guilty parties. But he could not prevent the discharge of four workers who had made justifiable complaints to the administration. Moreover, his sanctions, which were directed against Lomov, were perceived by the master as unfair: for he had cause to complain about the shop chief for poor organization of material supply. The head economist, by his decision for the master to leave the shop did not come out very well from a moral standpoint. Moreover, he limited himself to a routine "putting out the fire" and also took a narrow professional administrative position. He normalized business relations to the extent that this was necessary "for today," true, at the price of moral losses (this is shown, incidentally, by the tone of his appeal to the workers). Having violated the etiquette of business communication, he hastened to accuse each person of inefficiency, thus degrading his subordinates. In searching for

the guilty parties he did not sense the moral significance of the problem situation. And this means that his choice was determined by economic factors alone.

We conducted the investigation of the conflict that has been described with the participation of managers of various ranks in the same plant. The evaluation of the behavior of each involved party was made on a 10-point scale.

For normalization of the conflict situation, the head economist received only 7-7.5 points.

The shop chief received a sharply negative evaluation, primarily because he did not manage to normalize business relations. He was given 10 negative points for his guilt, noting that the shop chief is responsible not only for the fulfillment of the production program, but also for the delivery to the shop of materials that are in short supply. And his entire system of controlling the deliveries turned out to be rather poor, and there were interruptions. But the main thing was his crude behavior, especially in dealing with Kryuchkov, who was the leader of the workers, and the shop chief provoked a situation of conflict: he did not want to listen to Kryuchkov, he ignored the justifiable complaints of the brigade, and he shouted at the master. In essence, he simply violated the norms of business communication and placed both Kryuchkov and Master Lomov in a situation where they had nothing left to do but also violate these norms. Kryuchkov did this openly, by sending the brigade home as a sign of protest. Master Lomov was forced to straighten things out, and therefore he took a perfunctory attitude toward the unloading and then he also went home. But he too is guilty of the fact that the conflict began to grow. In the first place, he crudely demanded that the workers unload the trucks, without taking into account that the law was on their side. In the second place, he publicly blamed the brigade leader for his inability to organize the work. In the third place, he promised to pay overtime, knowing that this could not be done. Psychologically, he was oriented toward unloading the trucks at any price -- even with the help of crudeness and evasion of responsibility. Therefore he received 7.5-8 negative points. And only 2-2.5 positive points -- for his attempt to normalize the business relations. Incidentally, Kryuchkov received 8-9 points for this same attempt.

The master from the other shop helped to put everything right, but -- at state expense. At the same time he violated moral norms by contributing to self-seeking. In the eyes of the workers of the brigade, he increased his work authority (he gave the other shop the opportunity to come to the rescue and earn money), but by sending them to work outside their specialty he was guided primarily by selfish motives.

Those who participated in the investigation of the situation were critical of the brigade leader, giving his behavior a 5-point rating, that is, considering him guilty of the situation that was created since he did not take advantage of Kryuchkov's capabilities as the leader, and did not convince them by his personal example that the trucks really needed to be unloaded. Nor was he able to make a choice of an administrative decision to be adopted. He could have first organized the unloading and then after that submitted complaints to the shop administration on behalf of the brigade, relying, if necessary, on the

support of public organizations. Therefore he is also responsible for what happened.

It seems to us that the considerations expressed in this article and also the examples of concrete situations convince one mainly that there are no administrative decisions that have only economic consequences. Decisions are always social and always instill in subordinates either positive or negative qualities. An understanding of the psychological peculiarities when making administrative decisions will undoubtedly help to master more effective methods of administration.

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ANSWERS TO ARTICLE RAISING QUESTIONS ON MISUSE OF KTU INDEX PROPOSED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) pp 215-217

[Article by B. P. Kutyrev, candidate of economic sciences (Novosibirsk): "And Pocket Money -- Separate" cf pp 193-196]

[Text] Answer

The first and fundamental mistake when distributing earnings according to the KTU consisted in the incorrect mechanism for determining the coefficient. In the final analysis it turns out that the points that were not given to one person were transferred to another. Let us recall that the brigade leader received 1.7--this is what is left over from subtracting 7.3 (the sum of the coefficients of all the other members of the brigade) from 9 points. In the second place, there is a system of fines (reducing points). This is a violation of the principle of socialist distribution--payment for labor. One receives according to one's merits. Instead of this they receive what is left after subtracting what belongs to others or from themselves in the form of a fine for violations. Thus one encourages not social development, but the possibility of obtaining more as a result of one's comrades, giving rise not to a collectivist spirit, but intrabrigade competition. Instead of a desire to improve work and simultaneously increase the amount that is subject to distribution, the workers are motivated to increase their own coefficient at the expense of others.

In addition to these basic mistakes, there are also others.

When the points are brought together and subtracted, their importance changes because they are related to changing bases. If 0.2 is added for quality to 1.2 points, which includes 0.2 for mentor work, its importance will be less than if 0.2 is added to 1.0. It is understandable that when improving quality it is necessary to exert more effort because some of the effort goes for mentorship. It turns out that while striving to encourage the same thing we achieve the necessary goal, and for one and the same thing we encourage (or punish) in different ways.

Dvalishvili was penalized, perhaps, too much. Even if he did not come to work and did not notify his comrades, he made up for the absence and everyone knew

about this. Ivanov did no less than the others, but he was given only 0.5 points "for his position." One cannot understand a position which takes into account not the results of labor, but status: if you are a student you cannot receive more than half. Again it turns out that it is not payment for labor. In essence, Varyanov's additional payment for tutorship was also given only "for his position": Ivanov could easily avoid admonitions. The brigade leader's coefficient was also possibly too high. During the past month Ostannin rarely had to perform duties that were purely those of a brigade leader: once--when Dvalishvili did not show up at work, and twice when it was necessary to redistribute an assignment because of Yelevskiy's absence. It is not quite understandable why Bogdan and Zhilkin had a lower coefficient because of their rank. Here too it was necessary to take into account primarily the results of their labor. Nor could one bypass the factors that caused Amosov to turn in defective work.

Thus we come to the conclusion that the distribution in the brigade took place in violation of the principle of payment for labor. And this was manifested both in the mechanism itself and in its concrete application, particularly in the inflexibility of the evaluations and the incorrect interpretation of the importance of the various factors.

But to figure out the mistakes is only half of the matter. How can things be done better? Which procedure for distribution according to the KTU is the most correct? The answer to this question is presented in the table.

Table. Distribution of Additional Earnings and Bonuses in the Brigade
According to the KTU

Factors	Their importance	Numbers of brigade members								
		1	2	3	4	5	6	7	8	9
Output	0.8-1.2									
Quality	0.7-1.3									
Skills	0.6-1.4									
Combining jobs	0.7-1.5									
Assistance to comrades	0.8-1.2									
Tutorship	0.9-1.1									
Labor discipline	0.4-1.8									

Each worker is given the points he has earned from the interval according to the factors that are given. The interval is broader, the greater the need to stimulate the worker's growth in terms of a given factor. The points throughout the entire column are multiplied for each, and then the products are added together. The 720 rubles that are to be distributed according to the KTU are divided by this sum, which results in the "value" of 1 point. By multiplying the "value" by the points of each worker one receives their share. The practical session has no information for a concrete calculation, but the reader can do the calculation himself. And he will see how to eliminate the aforementioned mistakes.

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ANSWERS TO ARTICLE RAISING QUESTIONS ON RETURNING REFORMED ALCOHOLICS TO FORMER POSITIONS OFFERED

Novosibirsk EKO: EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 5, May 83 (signed to press 11 April 1983) p. 219

[Article "How to Return?" in preparation materials were used from the journals SOVETSKOYE GOSUDARSTVO I PRAVO, 1980, No 12 and CHELOVEK I ZAKON, 1980, No 8]

[Text] 1. The court sends citizens to LTP's for compulsory treatment if they regularly abuse alcohol and because of their drunkenness violate labor discipline, social order and the rules of socialist communal living, in spite of measures of a public and administrative nature that have been taken, and when they refuse voluntary treatment or abuse alcohol after treatment. One of the most important conditions is a medical conclusion that the individual is an alcoholic, that he needs treatment and there are no counter indications of compulsory treatment.

2. According to the existing provisions, a person who has ended up in the drunk tank two or three times in a year is sent to the narcological clinic for examination.

3. The court decree concerning sending a worker to a therapeutic labor clinic is a sufficient (but not mandatory) justification for firing him without paying severance pay.

4. Vacation is not granted for the period spent in a therapeutic labor clinic.

5. People who have returned from a LPT are given a job, as a rule, in the place of their previous work.

6. Labor placement of those who have returned from therapeutic labor clinics is the responsibility of the ispolkoms of the rayon and city soviets of peoples' deputies.

7. The time spent in a therapeutic labor clinic is not included in continuous labor tenure if the interruption between the day of departure from the clinic and the day of arrival at work exceeds one month.

8. The length of service that gives the right to obtain benefits established for people working in regions of the Far North and location on an equal footing with them is not interrupted if the person arrives for work in this region

within two months after leaving the LPT, not including the time for transportation to the place of work.

9. The time spent in a therapeutic labor clinic will not be included in the time period of Valetov's under the contract, but the year and a half before the LPT will be included.

10. The medical commission of the therapeutic labor clinic can send a petition to the people's court concerning early release from the LPT.

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